ENGINEERING NEWS-RECORD

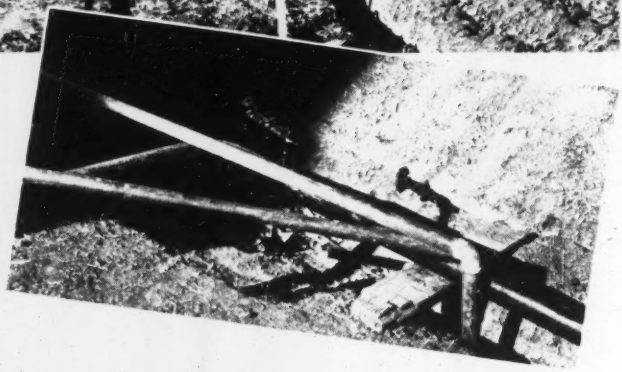
A McGRAW-HILL PUBLICATION

JUNE 9, 1949

Sheer rock walls of Greece's Corinth Canal echo to shipping noises again, as the artery is cleared of war debris

• • •

LOUISVILLE LOCKS ITS DOORS AGAINST THE OHIO RIVER



TO FORESTALL Sabotage BY ALKALINE SOIL— THIS REPLACEMENT IS BYERS WROUGHT IRON PIPE

The extensive gas distribution system at a western correctional institution faces an active threat of underground attack. The lines run through alkaline soils, and the severe corrosive condition had riddled the original line after only eight years of service. In replacing these lines, several thousand feet of 2-inch, 4-inch, 6-inch, and 10-inch Byers Wrought Iron pipe was installed, to serve the three gas-fired boilers in the heating plant and the residential area, and to connect meter house and boiler house. The pipe was welded, and a test of 150 lbs. pressure revealed no leaks whatever.

The soundness of the choice of wrought iron is confirmed by dozens of longtime service records. For instance: a 16-inch line laid in West Virginia in 1895, equipped with new couplings in 1932, and relaid, and considered by the owners as one of the most reliable in their network . . . an 8-inch wrought iron line in Kentucky, relocated when it was 50 years old and found in first-class condition . . . and the 12-inch line in New Jersey, where only one repair (due to electrolysis) was necessary in 37 years. These are only a few examples.

Wrought iron's ability to serve so long and so well comes from its unique character. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and disperse corrosive attack, and so discourage pitting. The fibers also anchor the initial protective scale, which shields the underlying metal.

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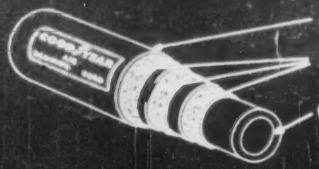
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B—Multiple-ply, high-tenacity rayon cord for strength and flexibility.
C—Seamless synthetic tube resists lubricants, doesn't flake or swell.

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bounces away cuts, abrasion, gouges, digs

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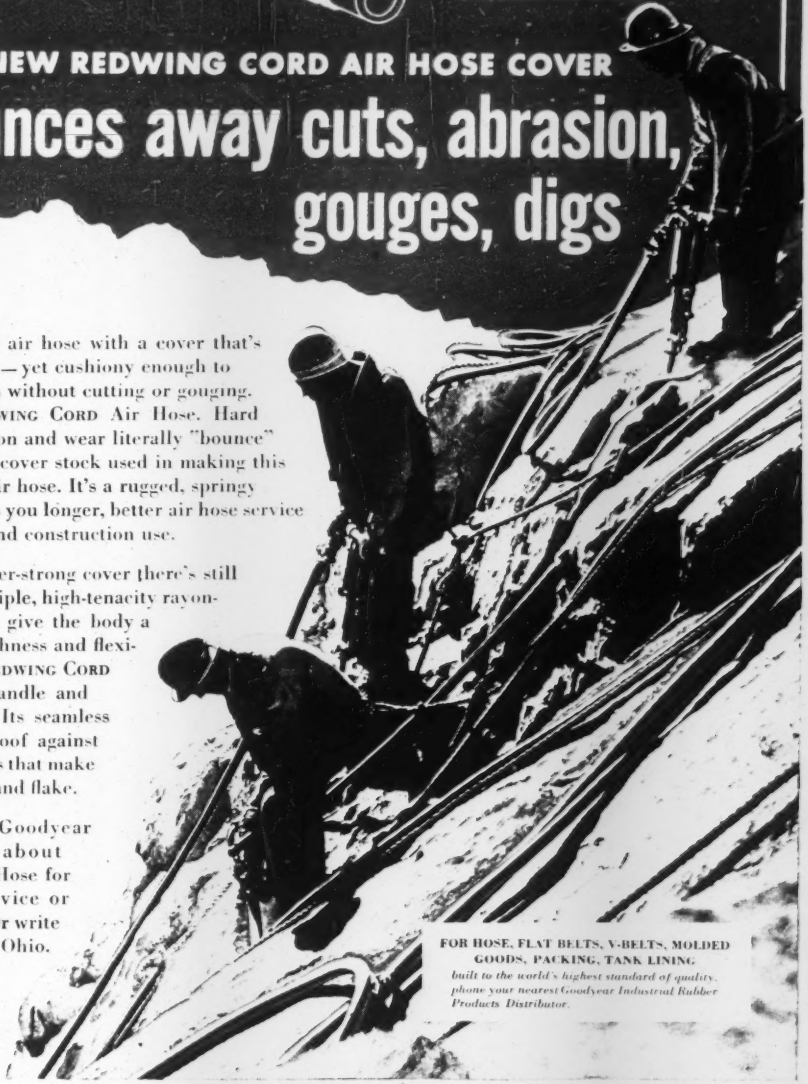

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ENGINEERING NEWS-RECORD

VOLUME 142 JUNE 9, 1949 NO. 23

WALDO G. BOWMAN
Editor

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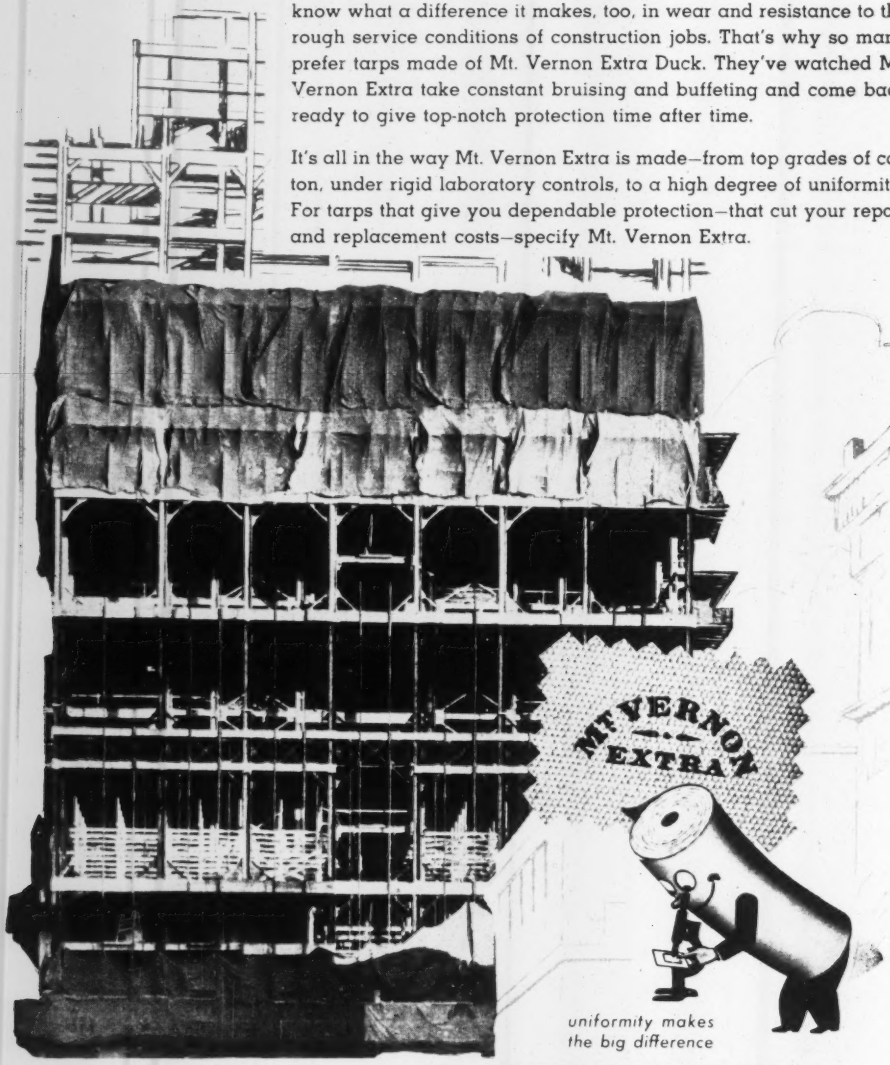

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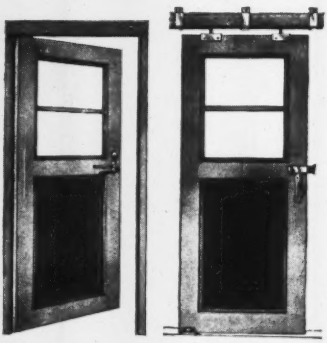
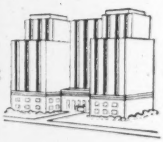
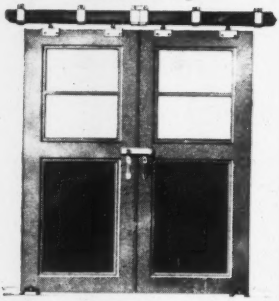


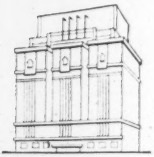
Single Swing Single Slide

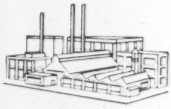


Double Swing



Double Slide





● Truscon Series 31 Industrial Steel Doors are made of carefully formed heavy gauge tubular steel members, reinforced at the corners and electrically welded at the joints. The stiles and rails are made from No. 16 gauge steel tube, 5" x 1¾". The corners are welded solidly and ground smooth. Stock types are in sash panel design only. Solid panel doors will be furnished for shipment from Youngstown at same price.

Doors can be equipped with lever latch or cylinder lock hardware. Slide doors have hasp and staple hardware.

NOTES

Sizes shown are door leaf sizes. See table for door opening and masonry opening sizes. Doors No. 2868, 3070 & 3870 may have muntins omitted or have solid panels in place of sash panels. Solid panel doors are not stocked. Doors No. 4080 & 50-100 are furnished only with sash panels as shown. Single doors shown are combined to make double doors.

DOOR NUMBER	DOOR SIZE		SWING DOOR OPENING DIM		SWING DOOR *MASONRY OPG DIM		SLIDE DOOR OPENING DIM		GLASS SIZES
	Width	Height	Width	Height	Width	Height	Width	Height	
Single Doors									
2868	2 7⅛"	6 7¼"	2 8"	6 8"	3 0½"	6 10¼"	.....	.....	21⅞" x 16"
3070	2 11⅛"	6 11¼"	3 0"	7 0"	3 4½"	7 2¼"	2 8"	6 10"	25⅛" x 18"
3870	3 7⅛"	6 11¼"	3 8"	7 0"	4 0½"	7 2¼"	.....	.....	16⅞" x 18"
4080	3 11⅛"	7 11¼"	4 0"	8 0"	4 4½"	8 2¼"	3 8"	7 10"	18⅞" x 15⅞"
50-100	4 11⅛"	9 11¼"	5 0"	10 0"	5 4½"	10 2¼"	4 8"	9 10"	24⅞" x 15⅞"
Double Doors									
5468	5 3⅝"	6 7¼"	5 4"	6 8"	5 8½"	6 10¼"	.....	.....	21⅞" x 16"
6070	5 11⅛"	6 11¼"	6 0"	7 0"	6 4½"	7 2¼"	5 8"	6 10"	25⅛" x 18"
7470	7 3⅛"	6 11¼"	7 4"	7 0"	7 8½"	7 2¼"	.....	.....	16⅞" x 18"
8080	7 11⅛"	7 11¼"	8 0"	8 0"	8 4½"	8 2¼"	7 8"	7 10"	18⅞" x 15⅞"
100-100	9 11⅛"	9 11¼"	10 0"	10 0"	10 4½"	10 2¼"	9 8"	9 10"	24⅞" x 15⅞"

*Masonry opening dimensions listed for swing doors are based upon the use of Truscon Standard Pressed Steel Door Frames.

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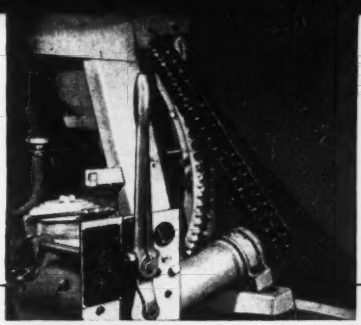

THE CHAIN TAKES THE STRAIN

The exclusive Rex chain drum drive eliminates stresses and strains. The chain protects transmission . . . gears . . . shafting . . . power plant. It eliminates binding between drum and transmission as the truck chassis weaves over uneven ground. The chain effectively dampens vibration, assuring far less driver fatigue.

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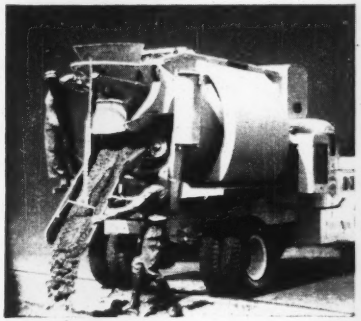

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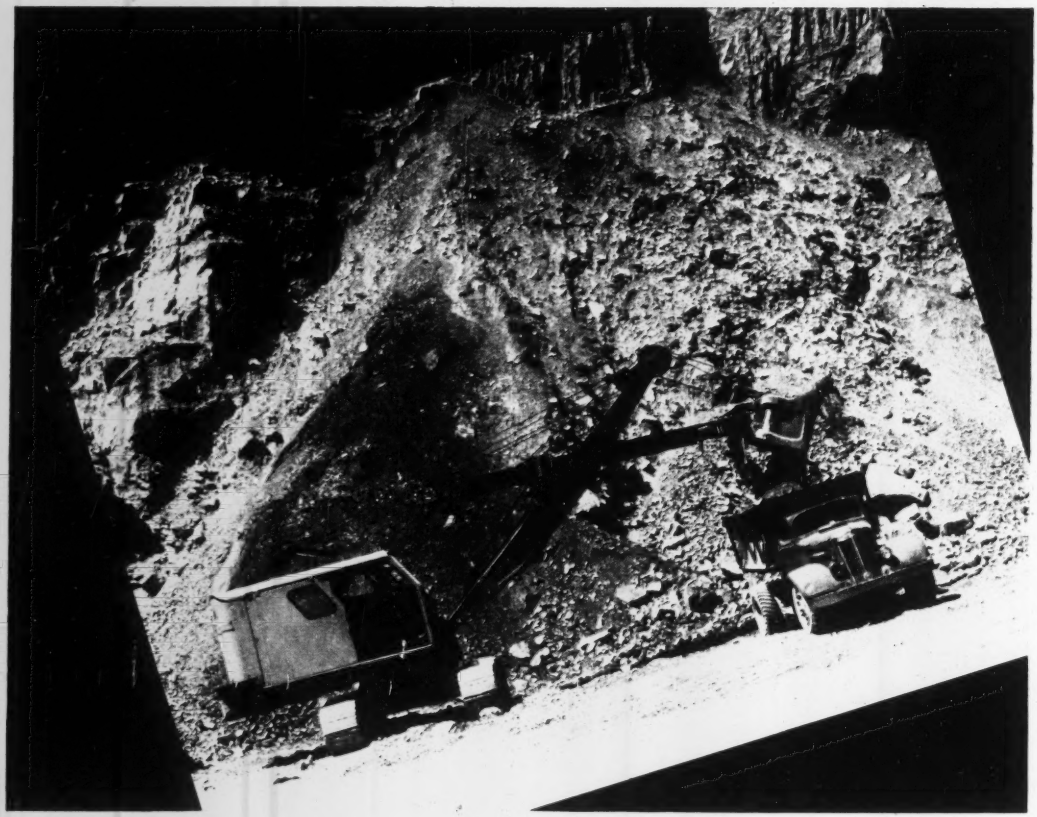

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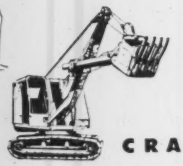

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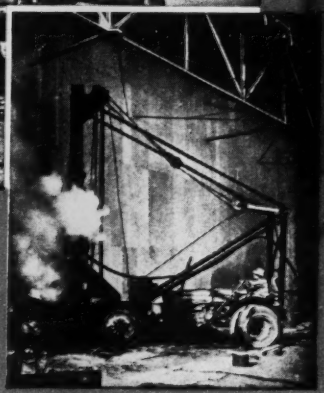

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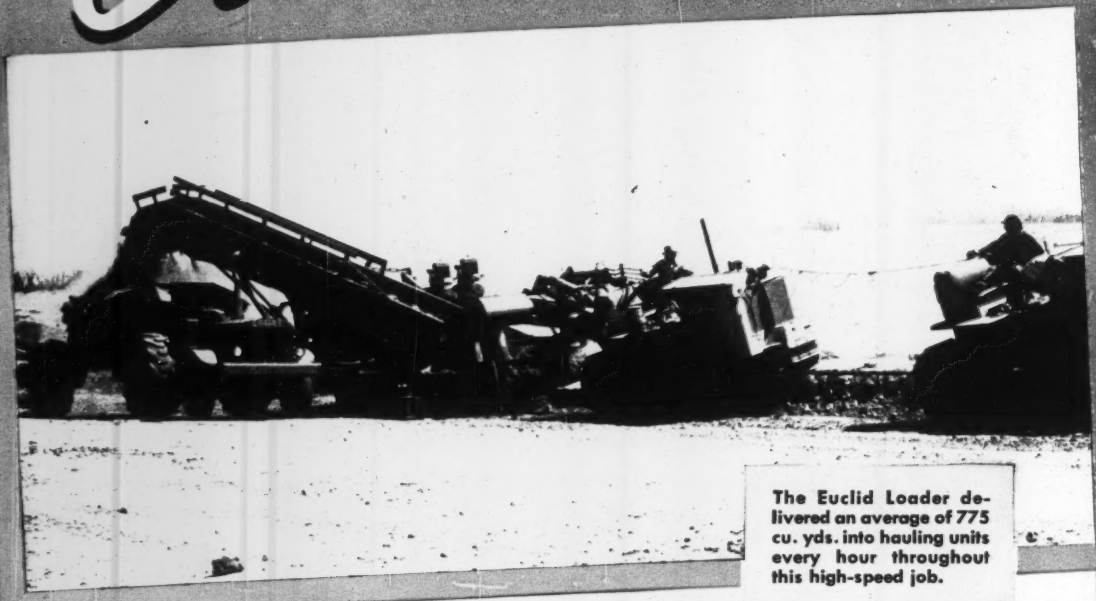

The Euclid Loader delivered an average of 775 cu. yds. into hauling units every hour throughout this high-speed job.

Steep, smooth sides of the improved hopper and full length and width door opening shed the big loads fast in even windrows on the fill.

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At the peak of operations the Loader, "Eucs," and other hauling units attained hourly production of over 950 cu. yds., averaging 775 cu. yds. per hour for the entire job. Powered by diesel engines of 190 h.p., the Bottom-Dump "Eucs" maintained high speeds with capacity loads on the 3,200-ft. haul. The 24.00 x 25 tires on drive and trailer wheels provided excellent traction and flotation on the fill.

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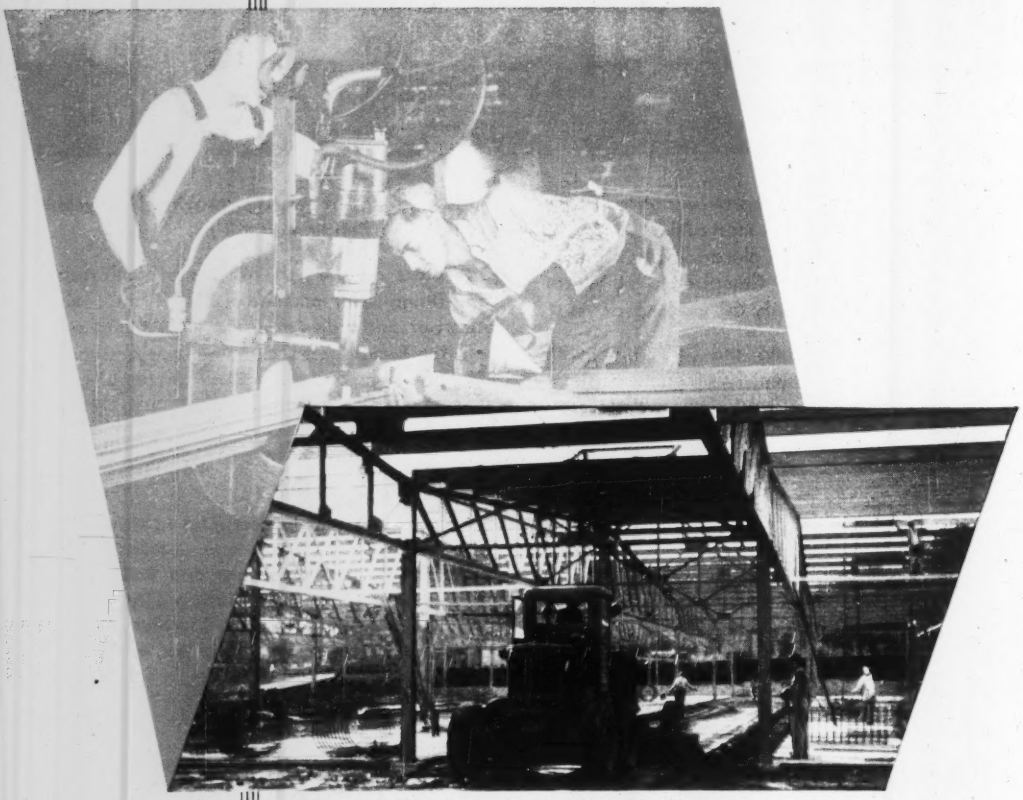
Cable Address.... YUKLID

Good haul roads enabled the "Eucs" to travel at high speed with capacity loads. Top speed of this Euclid model with full payload is 34.4 miles per hour.

Move the Earth



International Harvester Parts Depot, St. Paul, Minn., 1200 tons structural steel.

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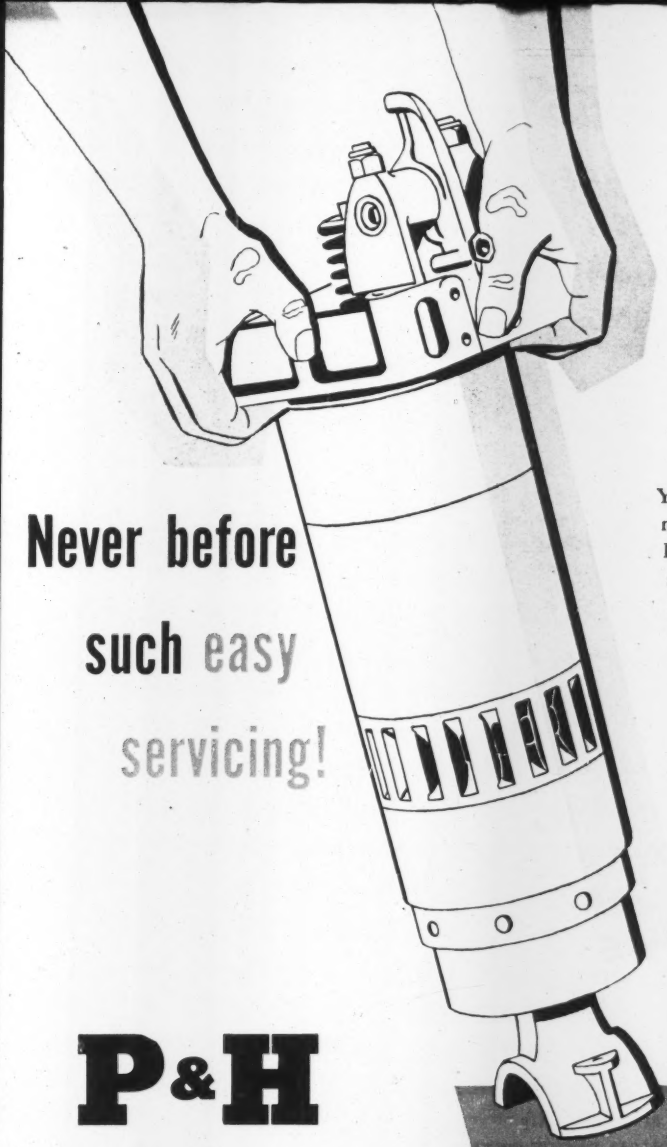


Never before such easy servicing!

Yes, days of servicing or overhaul time are now shortened into hours with the new P&H Diesels. Cylinder head, liner, piston and rod assembly is quickly removed as a unit — without disturbing engine mounting — without even dropping the oil pan.

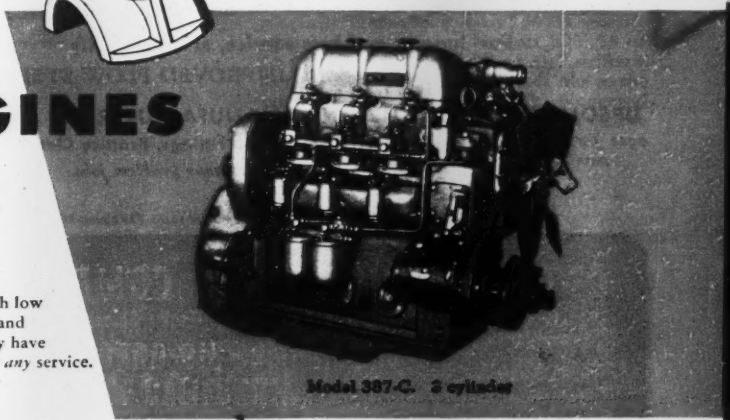
These complete cylinder assemblies are interchangeable, permitting transfer from one engine to another. It can be done right in the field. Lost operating time is cut to a minimum. Literature on request. Address Harnischfeger Corporation, Diesel Division, Port Washington, Wis.

P&H DIESEL DIVISION HARNISCHFEGER CORPORATION

P&H DIESEL ENGINES

2 CYCLE

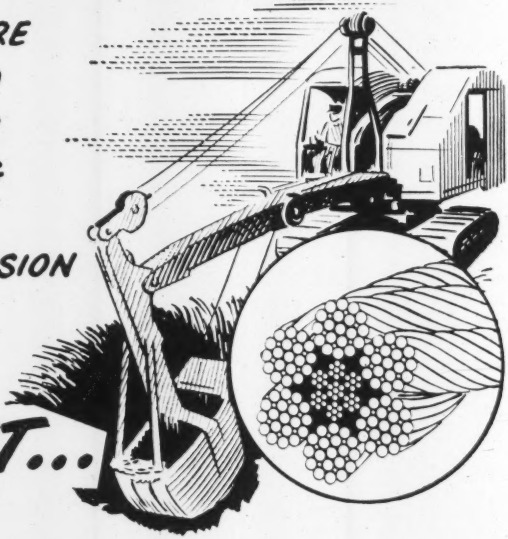
P&H Diesels are simplified, compact power units with low weight per horsepower. They are designed to withstand the severe power demands of excavator service. They have proved themselves in that service—are now ready for *any* service.



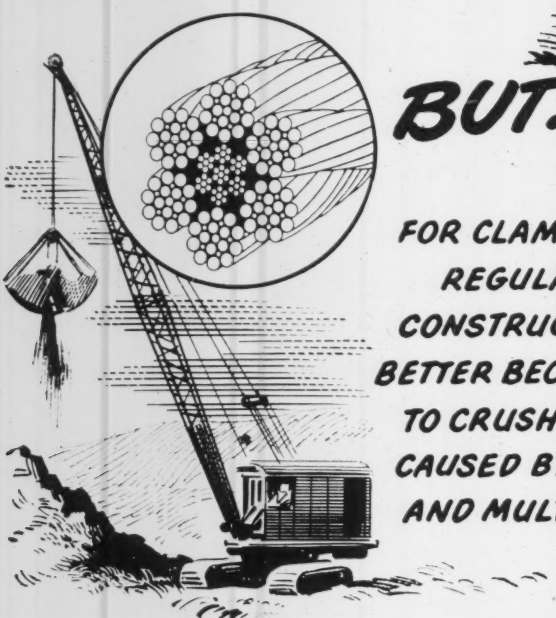
Model 387-C. 2 cylinder

SOME ROPES FOOL YOU

U-W 6x19 LANG LAY FILLER WIRE CONSTRUCTION (WITH I.W.R.C.) IS GOOD FOR TRENCH HOES OR BACK DIGGERS BECAUSE LANG LAY CONSTRUCTION OFFERS GREATER RESISTANCE TO ABRASION AND BENDING FATIGUE



BUT...



FOR CLAM SHELL CRANES, U-W 6x19 REGULAR LAY FILLER WIRE CONSTRUCTION (WITH I.W.R.C.) IS BETTER BECAUSE IT IS MORE RESISTANT TO CRUSHING AND DISTORTION CAUSED BY HIGH RADIAL PRESSURE AND MULTIPLE SHEAVE REEVING

For longest and best service, always specify
U-W LAYRITE (*Preformed*) IMPROVED PLOW STEEL

UPSON-WALTON IS THE ONLY MANUFACTURER OF ALL 4•••
Wire Rope, Tackle Blocks, Wire Rope Fittings, Brattice Cloth.
We invite you to let us engineer your problem jobs.

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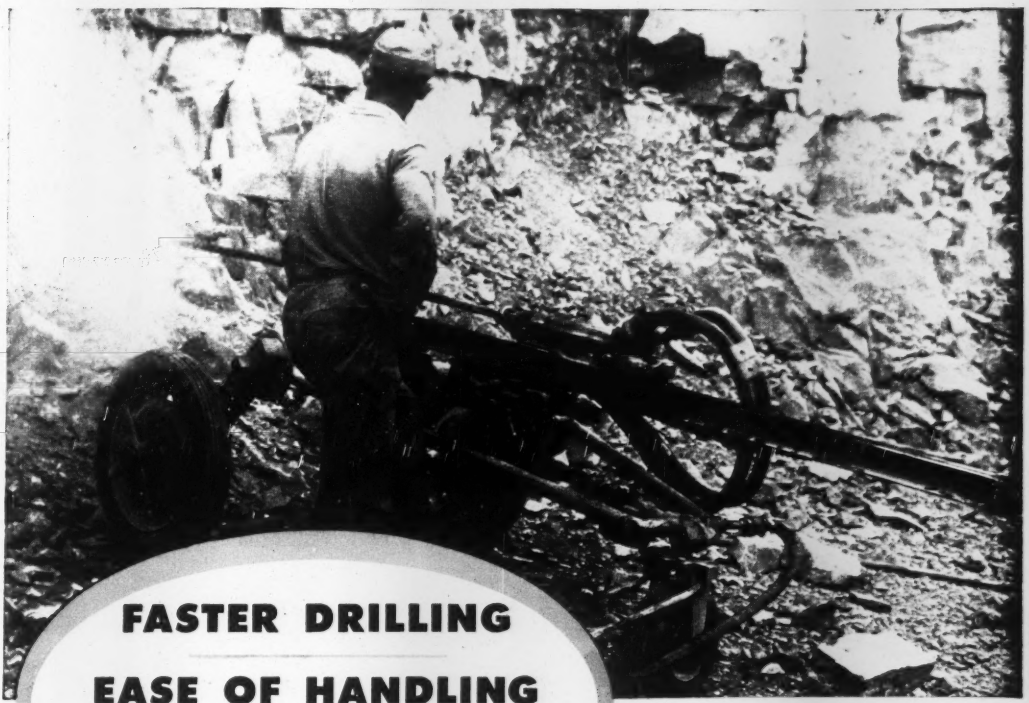
THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street, New York 4
3525 West Grand Ave., Chicago 51
241 Oliver Building, Pittsburgh 22

JOY ONE-MAN LIGHTWEIGHT WAGON DRILL



FASTER DRILLING

EASE OF HANDLING

LOW MAINTENANCE

Above, *drilling toe-holes—no need to stop drilling to blow. Piston speed and blow automatically adjusted to give fast, consistent and economical drilling in every kind of formation—especially in overburden, clay seams and other material that varies from hard to soft.*

You'll get *more hole* per shift, at lower costs, with the *exclusive* "drill and blow" feature of the JOY Lightweight Wagon Drill. And it's really lightweight—only 750 lbs.—easily operated by one man. Mounts JOY 55 or 65-pound sinkers, and 3" or 3½" drifters, as needed . . . requires no spikes due to the positive locked brakes. JOY pioneered the Lightweight eight years ago—more than 500 now in operation. It can save you time and money—*write for bulletin.*

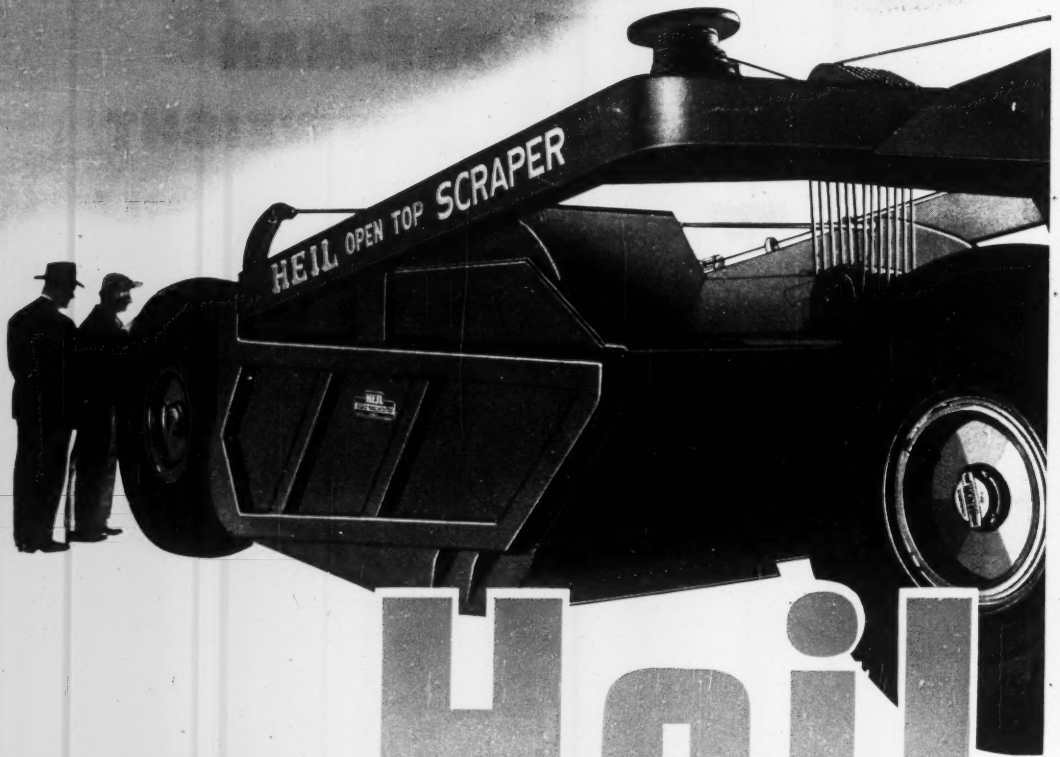
Consult a Joy Engineer

W&D C 2011

JOY MANUFACTURING COMPANY

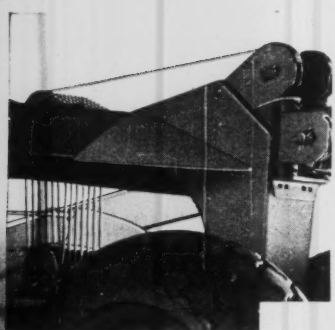
GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY CANADA LIMITED, GALT, ONTARIO



Heil

Move More



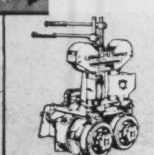
Cables and large-diameter sheaves are located outside the bowl, away from the dirt, for longer cable and sheave life.

Heil open-top construction gives greater stability, full vision of cutting edge, maximum heaped loads, and trouble-free shovel-loading.

1. **HEIL'S bowl design eliminates voids, giving you bonus loading**

2. **The weight of the HEIL scraper is placed on the cutting blade . . . for faster digging**

The Heilliner.



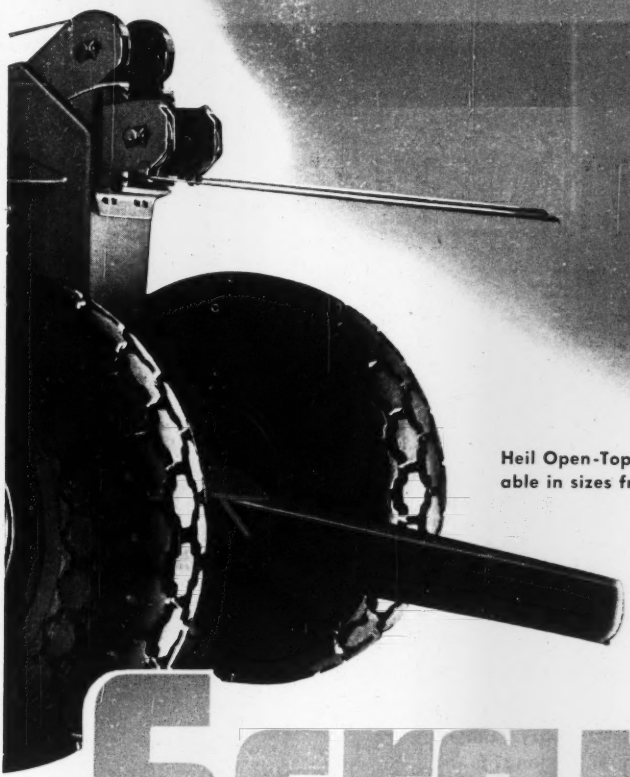
Power Control Unit.

Heil Hydraulic Dozer.

Heil Cable Dozer.

Heil Light-Duty, Heavy-Duty, and Rock Bodies.

Heil Platform Conversion Hoist — converts any fixed-bed truck into a time-saving dump unit.



Heil Open-Top Scrapers are available in sizes from 6 to 25 cu. yd.

Scrapers

Dirt... because:

3. HEIL'S tilting-floor action provides fast, clean dumping

Add these advantages to the other Heil Scraper features, and you have a dirt-moving champion. Send coupon below for full information. Check the other Heil products that interest you.

HEIL

THE HEIL CO., Dept. 169, 3001 W. Montana Street, Milwaukee 1, Wisconsin

Please send me complete information on the items I have checked below:

- ☐ **Heiliner** — 2-wheel prime mover
- ☐ **Heil Scrapers** — tractor-drawn
- ☐ **Heil Hydraulic Dozers** — specify make of tractor
- ☐ **Heil Cable Dozers**—specify make of tractor
- ☐ **Heil Power Control Units**
- ☐ **Heil Light-Duty Dump Bodies**—specify make of truck
- ☐ **Heil Heavy-Duty Dump Bodies**—specify make of truck
- ☐ **Heil Platform Conversion Hoists**

Name..... Title.....

Company.....

Address.....

City..... ( ) State.....

R-103

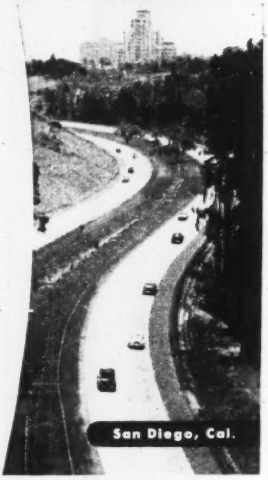
CONCRETE Expressways solve urban traffic congestion

Multiple-lane concrete expressways like those illustrated here are solving traffic congestion and safety problems in cities from coast to coast.

Modern expressways end traffic congestion with safety by dividing opposing traffic lanes, separating cross traffic and limiting access.

Portland cement concrete pavement has the stamina and durability for the heavy weight and volume of traffic that expressways carry. Concrete pavement is moderate in first cost, has long life and low maintenance expense. This ***low-annual-cost*** service pleases motorists and taxpayers alike.

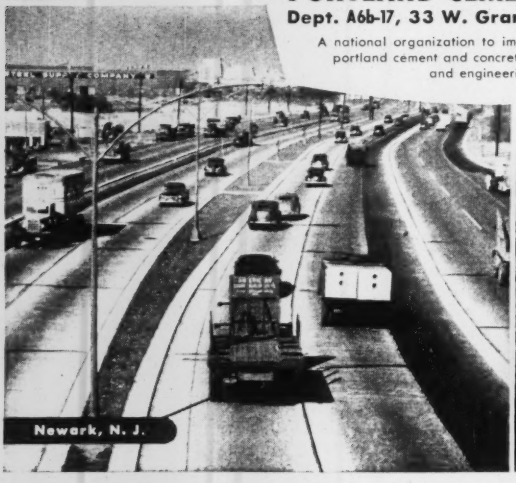
For more examples showing how modern concrete expressways are solving urban traffic problems write for free booklet, *"Concrete Expressways,"* which is distributed only in the U. S. and Canada.



PORTLAND CEMENT ASSOCIATION

Dept. A6b-17, 33 W. Grand Ave., Chicago 10, Ill.

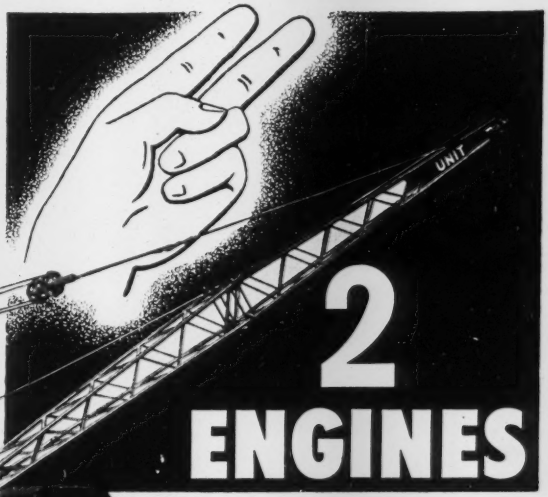
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

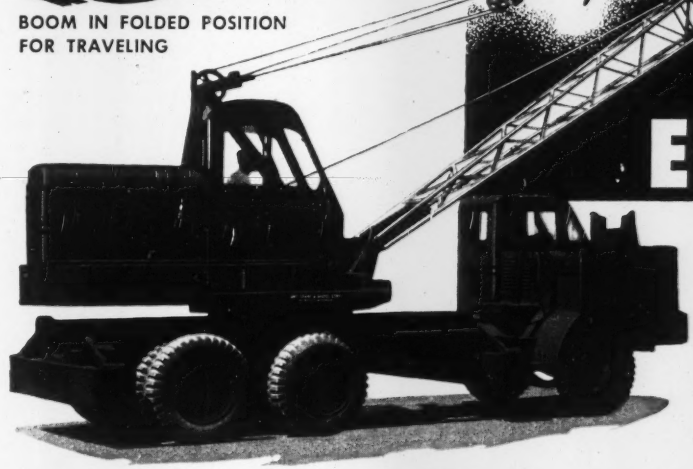


UNIT 1014

10 TON TRUCK CRANE WITH DUAL POWER

BOOM IN FOLDED POSITION FOR TRAVELING



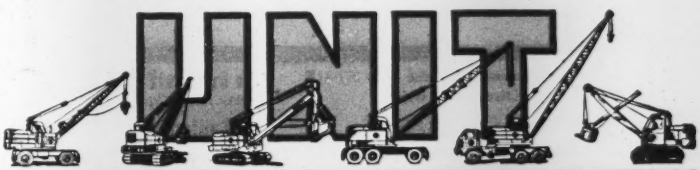


- One Engine for Speed and Mobility
- Another Engine for Lifting or Digging
- Gas or Diesel Power
- Road Speed: 32 M.P.H.
- Capacity: 10 Tons

One look at the UNIT 1014 will convince you that here is Truck Crane design at its best. Perfectly balanced, it has modern, adjustable hook-roller construction. Power flows from the truck engine in a direct straight-line drive to the tandem rear axles, both of which drive. A separate engine powers the upper structure, and may be either gas or diesel. Double, full-width outriggers provide added stability. This streamlined unit has 5 speeds forward and one reverse, with an auxiliary transmission offering 10 speeds forward and 2 speeds reverse. A road speed of up to 32 M.P.H. makes "going from job to job in a hurry" a simple matter. Large diameter, wide-faced air brakes are used on all 4 rear wheels. A hand operated, shoe type parking brake is provided on the propeller shaft. A short turning radius increases its value in close-quarter operations, and all dimensions meet highway requirements.

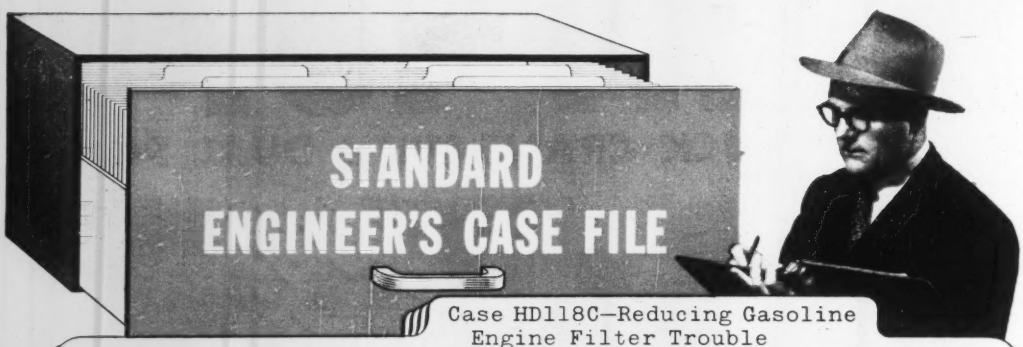
UNIT CRANE & SHOVEL CORP.
6315 W. BURNHAM STREET, MILWAUKEE 14, WISCONSIN, U.S.A.

● Other UNIT Models are available in ½ and ¾ Yd. Excavators and Cranes up to 15 Tons . . . Crawler or Mobile Types . . . Fully convertible to ALL attachments.

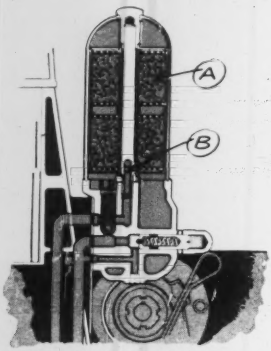


SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

A 5523-1P-C



Case HD118C—Reducing Gasoline Engine Filter Trouble



GASOLINE ENGINE OIL FILTER

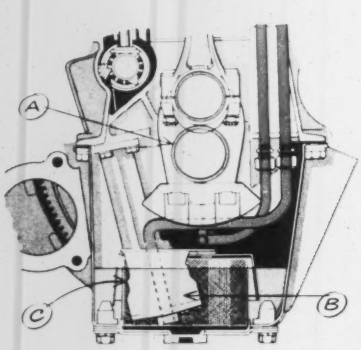
When a produce growing and shipping company switched to RPM Heavy Duty Motor Oil for its trucks and tractors, filter deposits were practically eliminated and overhaul periods were more than trebled. RPM Heavy Duty Motor Oil is recommended for both gasoline and Diesel engines. Comes in grades to suit every service.

A. Contains special oxidation inhibitor — minimizes the formation of contaminants in the oil, and collection of deposits in filters.

B. Minimum oil oxidation assures better oil circulation in passages and thorough cleaning of oil by filters.

RPM Heavy Duty Motor Oil is made from base oils that are selected for their inherent ability to withstand extreme heat and resist oxidation.

Case HD1118D—Keeping Parts Clean and Better Lubricated



GASOLINE ENGINE OIL SYSTEM

RPM Heavy Duty Motor Oil reduced wear on all parts in the trucks and tractors mentioned in case above. When crankcases were drained it was noted they were exceptionally clean with no sludge deposits.

A. A special compound in RPM Heavy Duty Motor Oil keeps a tough lubricating film on bearings, cylinders and other parts under all conditions — sticks to hot spots and will not expose bearings and cylinder walls when engines are idle.

B. Detergent helps remove any lacquer and gum that may form in oil systems and on parts and keeps them dispersed in the oil so they flow out with draining.

C. Inhibitor prevents foaming—promotes better functioning of oil pumps, assures positive oil-level checks with dipstick.

RPM Heavy Duty Motor Oil is non-corrosive to all bearing metals.

For additional information and the name of your nearest Distributor, write

STANDARD OIL COMPANY OF CALIFORNIA

225 Bush Street, San Francisco 20, California

The California Oil Company
Barber, N. J.—Chicago, Ill.

The California Company
17th and Stout Streets, Denver 1, Colo.

Standard Oil Company of Texas
El Paso, Texas

HEAVY DUTY RPM MOTOR OIL

Trademark Reg. U.S. Pat. Office

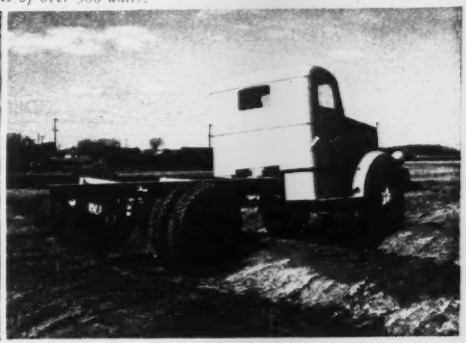
PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck

Here's actual operating proof in typical road construction service — an everyday job for this FWD operated by a county highway department. Going such as this demands trucks that can do the job. It demands trucks you can rely on every day. It demands FWDs. Yes — you can be sure with FWD even before you buy. Here's why. FWDs are scientifically tested on FWD's proving ground to twist over irregular ditches — 18 inches deep. *No wonder FWD trucks are the number one choice of states, counties, and municipalities — with individual fleets of over 500 units!*

WHAT FWDs DO ON THE PROVING GROUND
1 Highball over hilly curved roads!
2 Slog thru mud — up to the bumper!
3 Speed over 100-ft. unbanked circle!
4 Twist over ditches — 18 inches deep!
5 Drive up 6% grade thru 3-ft. of sand!
6 Climb 70% grade from dead stop!
7 Climb 8-in. beam from standstill!
8 Drill pole holes to prove equipment!
9 Speed safely over level highways!
1
2
3
4
5
6
7
8
9

This is FWD's proving ground. This is your assurance that the FWD you select has the stamina to insure long life without expensive mechanical breakdowns.



An FWD twists over 18-inch ditches on the proving ground. For all the facts, see your FWD distributor—or write FWD direct.

An Invitation To Truck Buyers

We invite you to watch FWDs pass a series of rigid performance tests. Ask your FWD distributor to arrange your visit to our plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy duty trucking problems.

Charles O. Person
President
The Four Wheel Drive Auto Company

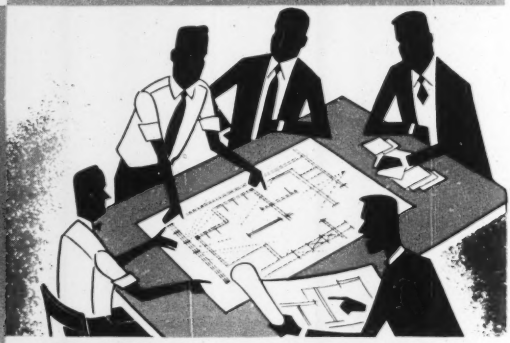
THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck

How building designers can get an **electrical layout that fits** ...and save time and money doing it!

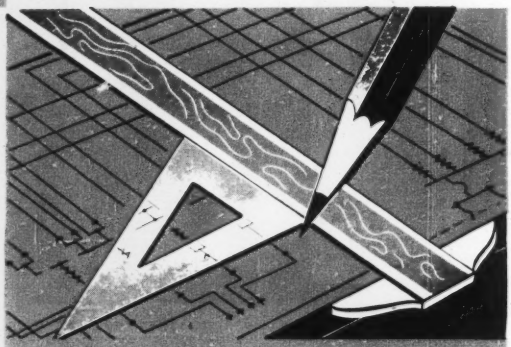
1 Before your draftsman touch pencil to paper, call, wire or write your nearest General Electric Office; an experienced building specialist will contact you.

2 Outline to him your preliminary plans and problems; show him the type and location of all electrical loads, special conditions which must be met.



3 At his disposal are many General Electric product engineers . . . authorities in the fields of power distribution, lighting, motors and control.

RESULTS: You save planning time and come up with electrical plans that fit your structure . . . plans that embody all up-to-the-minute electrical developments . . . specifications that assure the building owner maximum operating economies over the years, and establish your reputation for future jobs. Try this easy, 4-step planning method on your next job . . . you'll find it both profitable and enjoyable to work with a General Electric building specialist. ***Apparatus Dept., General Electric, Schenectady, N. Y.***



4 Using this wealth of G-E know-how, he will help you plan an integrated electrical system, around which you can easily draw up plans and specifications.

Electric Equipment for Commercial Building

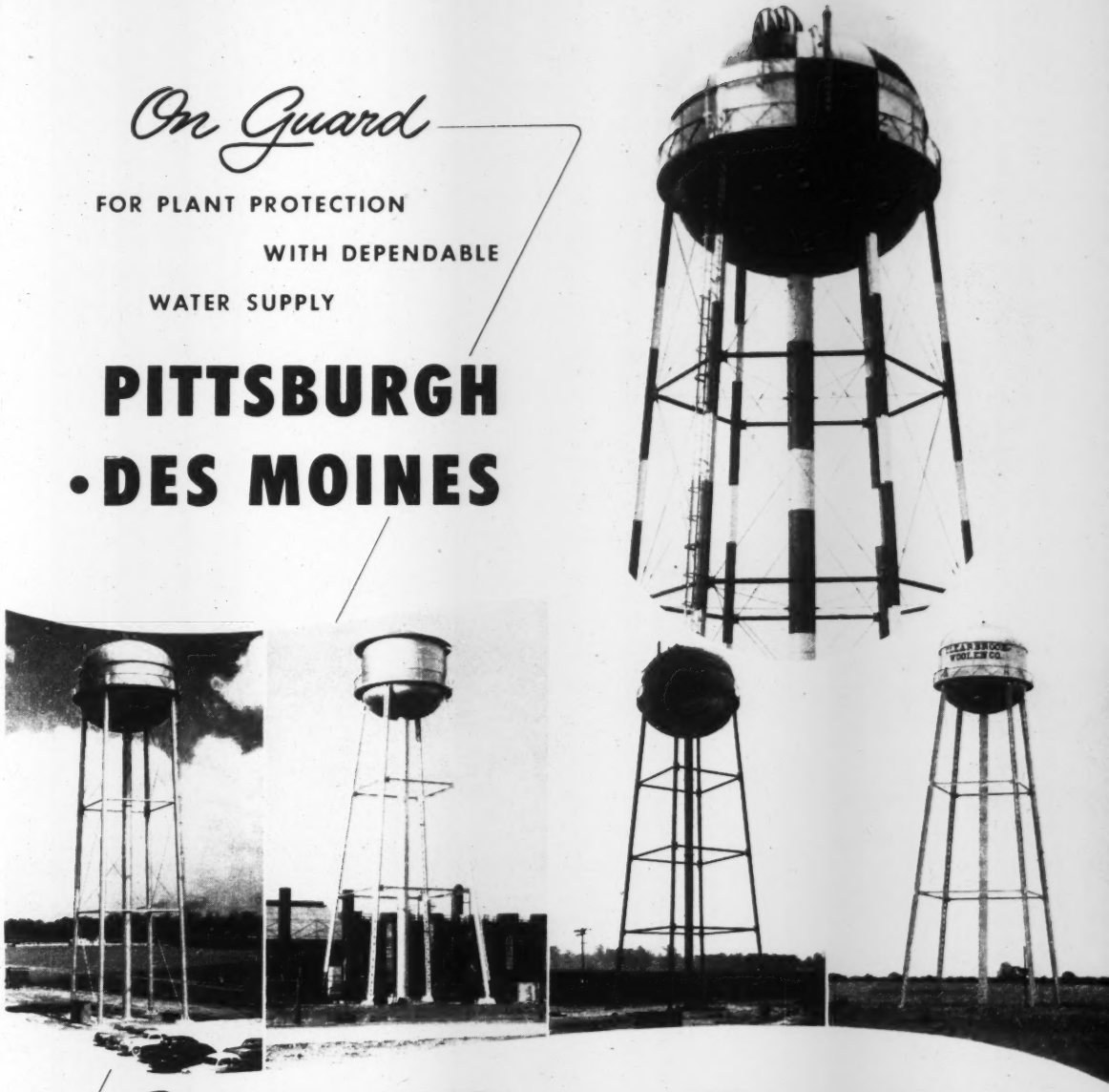
GENERAL ELECTRIC

GEB-106

On Guard

FOR PLANT PROTECTION
WITH DEPENDABLE
WATER SUPPLY

PITTSBURGH •DES MOINES



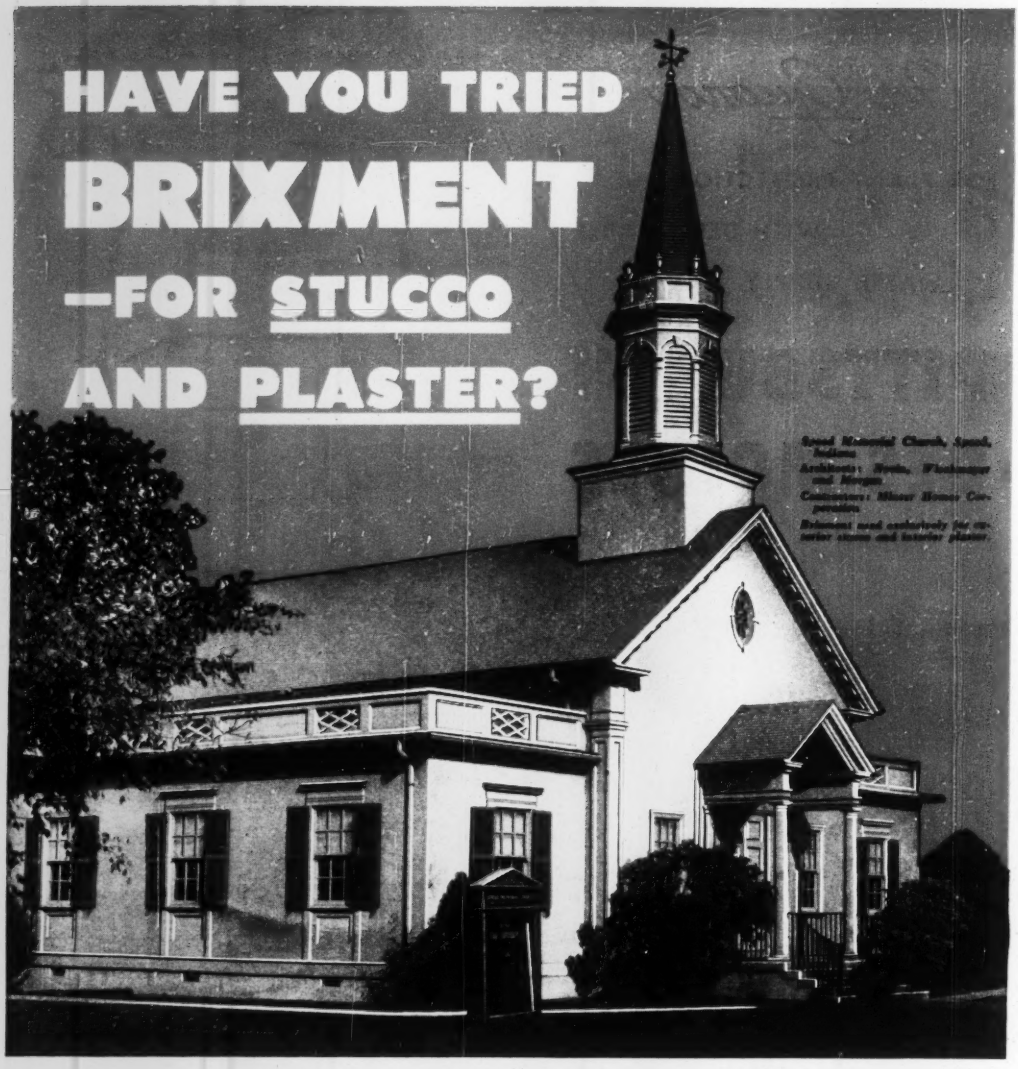
Industrial Elevated Steel Tanks

When a modern Pittsburgh-Des Moines Elevated Steel Tank supplies your sprinkler and fire-hose lines, you *know* you have water when you need it! Joined to this dividend-paying protection is the benefit of better, low-cost general water service—equally dependable and efficient. *We have the facts for you; just write—without obligation.*

PITTSBURGH • DES MOINES STEEL CO.
Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH . . . . . 3414 Neville Island
NEW YORK . . Room 916, 270 Broadway
CHICAGO, 1218 First National Bank Bldg.
DES MOINES . . . . . 915 Tuttle Street
DALLAS . . . . 1219 Praetorian Building
SEATTLE . . . . . 922 Lane Street
SANTA CLARA, CAL. . . 621 Alviso Road



This beautiful little church was stuccoed and plastered with *Brixment* — in 1924!

Today, 25 years later, the Brixment plaster and stucco are still in perfect condition.

Brixment has just as many advantages for *stucco and plaster* as for masonry. It works smoother and easier, has a more convenient hardening time, resists moisture and weathering. Since the great plasticity of Brixment permits leaner mixes, it eliminates or greatly reduces hair-checking and crazing. It is mixed and applied like Portland-cement stucco *except that no lime is required.*

If you are one of the thousands who know and prefer Brixment for *masonry*, we enthusiastically recommend Brixment to you *for stucco and plaster.* Ask your dealer, or write us direct, for a copy of the handbook, "Brixment for Stucco and Plaster."

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

LORAIN BUILDS ITS OWN!*

THEW-LORAIN 50th ANNIVERSARY 1899 1949

* **MOTO-CRANE**—a registered trade mark of the Thew Shovel Co., identifying a complete, intregral Thew-built rubber-tire machine—of turntable and carrier—with the carrier designed and built exclusively for a shovel-crane mounting.

● One thing we've learned since we built the original of all truck cranes 30 years ago, is that no commercial motor truck built to transport static pay loads is a proper, long-lasting mounting for the highly concentrated live loads of today's big capacity cranes.

That's why in 1939, Thew-Lorain decided to design its own carrier mounting for rubber-tire cranes—a carrier designed to do a job no motor truck can do—a carrier designed and built completely by a shovel-crane manufacturer exclusively for use as a shovel-crane mounting.

Today over 5000 Lorain Moto-Cranes, all on Thew-designed-and-built carriers are in service. Here's proof that shovel-crane users recognize the "built-from-the-ground-up" advantages of the Moto-Crane's "integrated" design. Ask your nearest Thew-Lorain distributor to tell you why *it isn't a Moto-Crane if it isn't a Lorain.*

THE THEW SHOVEL COMPANY, Lorain, Ohio

Cable Address: UNLOADER

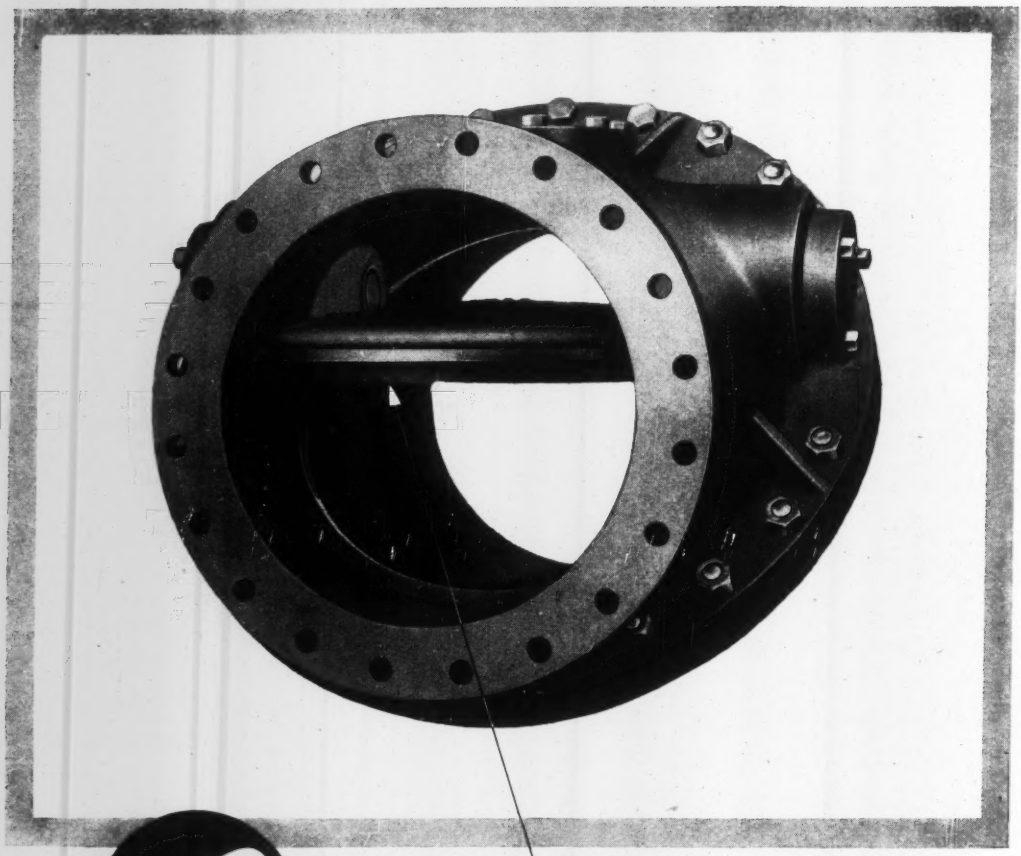
CHECK THESE MOTO-CRANE FEATURES

1. A shovel-crane carrier frame with built-in strength—not a makeshift or patch job.
2. 2 or 3 axle models; front wheel drive available.
3. Through drive on rear tandem axles on 6 wheel models.
4. Low and high speed travel ranges, 1 to 30 MPH.
5. Multiple tires for off-the-road soft ground flotation.
6. Thew patented rocker arm replaces springs on rear wheels of 6 wheel models.
7. Tractive effort to climb a 33% grade.
8. 3 sizes of Moto-Cranes; single engine self-propelled units a so available on Thew-built carriers.

Lorain®

IT ISN'T A MOTO-CRANE IF IT ISN'T A LORAIN

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES



pipe line surging with the cushioned closing of

CHAPMAN

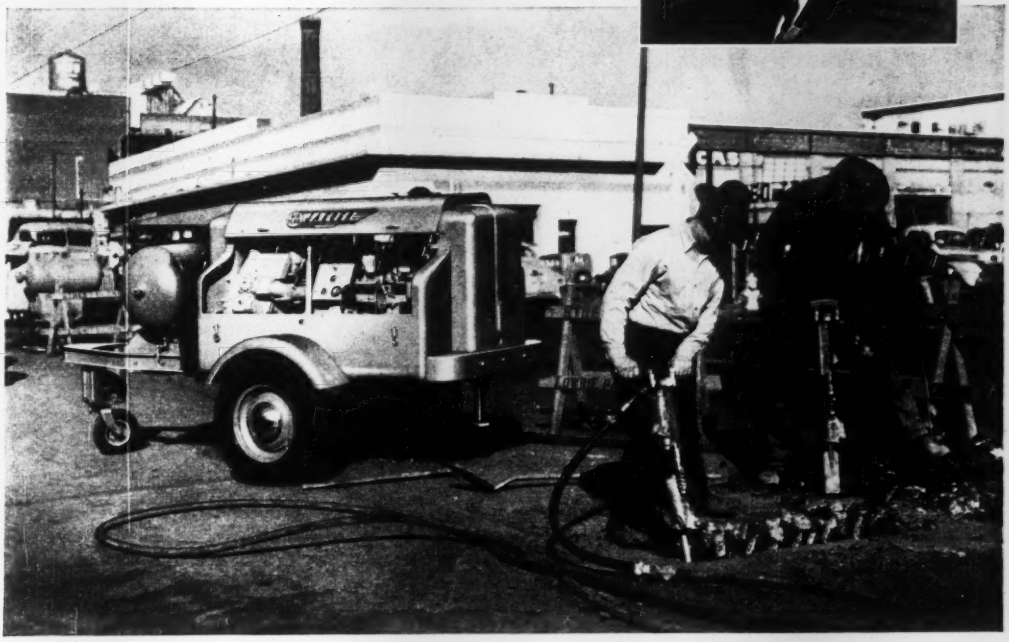
CHECK (TILTING DISC) VALVES

Cushioned by the effect of the stream on the short flap of the balanced disc, Chapman Tilting Disc Check Valves close smoothly and quietly. Slamming and dangerous pipe line stresses are eliminated . . . maintenance costs reduced. Head losses are cut 65% to 80% as compared with conventional type check valves.

Chapman Tilting Disc Check Valves are obtainable in either iron or steel. For complete information send for catalog No. 30.

The Chapman Valve Mfg. Co., Indian Orchard, Mass.

Wouldn't YOU look happy getting out 4 days' work in 3?



Lowrie Paving Company, leading paving and underground contractors in the San Francisco area, have found that their Jaeger "new standard" Model 125 Compressors will each operate two 85# breakers at continuous peak performance, thereby breaking as much as 40% more pavement than they were able to do with previous model machines.

"We are doing as much work in 3 days with the new standard 125 as we did in 4 days with 105 ft. machines" says Jim Lowrie, who now has a fleet of 5 Jaegers in continuous operation.

You can get a comparable increase in production with any "new standard" Jaeger Air Plus. From the Model 75 that holds full 90 lbs. pressure in a heavy pavement breaker, up to the Model 600 that runs 2 heavy wagon drills at full 90 lbs., every Air Plus rating is matched to today's tools, not the tools used in 1932 when 60 to 500 ft. of air was enough. Ask your Jaeger distributor to prove this on your own job.

Note: Because of "Fuel Miser" speed control, Jaegers use no more fuel than others when not delivering more air.

THE JAEGER MACHINE CO., Columbus 16, Ohio

Leading distributors in 130 cities of the U.S. and Canada sell, rent and service Jaeger equipment.

JAEGER

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GMCs have won this acclaim because they are products of the world's largest commercial vehicle manufacturer . . . because they are built with truck engines and chassis . . . because they provide a full measure of everything truck owners and drivers want.

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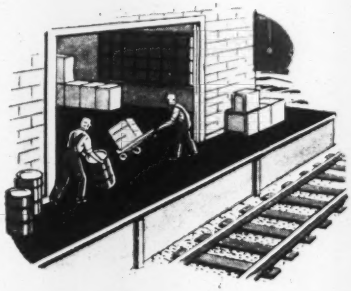
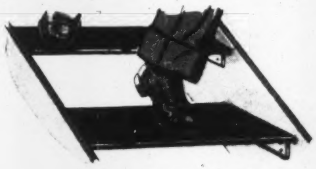
How You Can S-T-R-E-T-C-H YOUR FLOORING BUDGET...



Increase Service Life and Cut Maintenance Costs with Flintkote Flooring Products

Wherever you need a heavy duty utility floor, specify industrial asphalt mastic floors made with **FLINTKOTE FLOORING EMULSIONS.** Here are a few of the many advantages of this rugged, economical flooring:

You can lay it quickly and easily over almost any clean, firm base . . . new or old. It's quiet and resilient . . . comfortable to walk and work on. Mastic floors have high traction value, wet or dry. They can withstand heavy point loads, without indenting . . . or moving loads without shattering . . . and heal themselves of minor scars and cuts.



FLINTDEK will help keep you on a firm footing. Where slippery floors are a hazard, this anti-slip coating cuts risk and increases floor life. It has important qualities of resistance to fire, shock, gasoline, oil, water and weather. Flintdek is ideal for application by trowel in thin coats over almost any surface. Use it on slippery ramps, around machinery, on steps and ladder treads, on steel decks, in shower rooms and the like. Several attractive colors are available.

In offices and other areas using decorative flooring, particularly over a wood base where flexibility is essential, insure satisfactory results with **FLINTKOTE PERMAKOTE UNDERLAYMENT.** This lightweight mastic mix with a neoprene binder is especially designed for above grade floors . . . wood, concrete or steel. You get greatly increased resilience. And the sound-damping, shock-absorbing qualities of Permakote increase efficiency of personnel . . . add to service life of floors.

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- Premix Patching Mastic
- Anti-Slip Flintdek
- Permakote Underlayment
- Floor Sealers
- Tile Cements

And there are other Flintkote Flooring Products to help you stretch your flooring budget. Premix Mastic, ready mixed, ready to use for patching holes and breaks in concrete floors . . . Flintseal*, the hot-poured, rubber-asphalt compound for positive sealing of joints and cracks against water-infiltration.

Get complete information and specifications on these and other Flintkote Flooring Products. Write, today, to The Flintkote Company, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N.Y.

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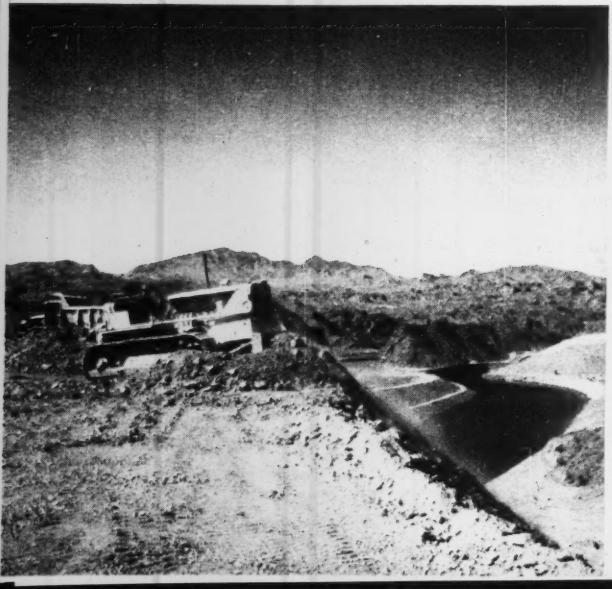
"Caterpillar"

This D8 Tractor with hydraulic-controlled No. 8S Bulldozer, owned by George & Lynch, Inc., Wilmington, Del., is working on a road near Cambridge, Md.

A "Caterpillar" Diesel D8 Tractor with cable-controlled No. 8S Bulldozer at work on a highway at Davis Dam, Arizona. Owned by Utah Construction Co., Kingman, Arizona.



MOVE

THERE are five good reasons why "Caterpillar" Bulldozers — cable or hydraulic controlled — regularly out-produce other units and get the call from owners everywhere.

1 The blade is scientifically curved to keep material rolling smoothly ahead. "Caterpillar's" long experience with motor grader blades helped in its design. It's a lot easier to *roll* dirt than to push it.

2 Controls (cable or hydraulic) give the operator instant, accurate control of the cut. No time is wasted in spinning tracks or excessive lugging down. Only "Caterpillar" cable control has multiple-disc, metallic-lined clutches for easy engagement and disengagement. There's no clutch drag.

3 Angling, tilt and tip adjustments are easy to make — a quick, one-man job for the operator.

4 There's long life in every blade. "Caterpillar" pays up to 30% premium for the high tensile steels that go into these 'dozers.

5 No overhead frame to interfere with visibility. The operator has a full view of the job.

Your "Caterpillar" dealer is as near as your telephone. He can advise you on your bulldozer needs, and he can get 'dozers for quick delivery. It will pay you to get your order in today.

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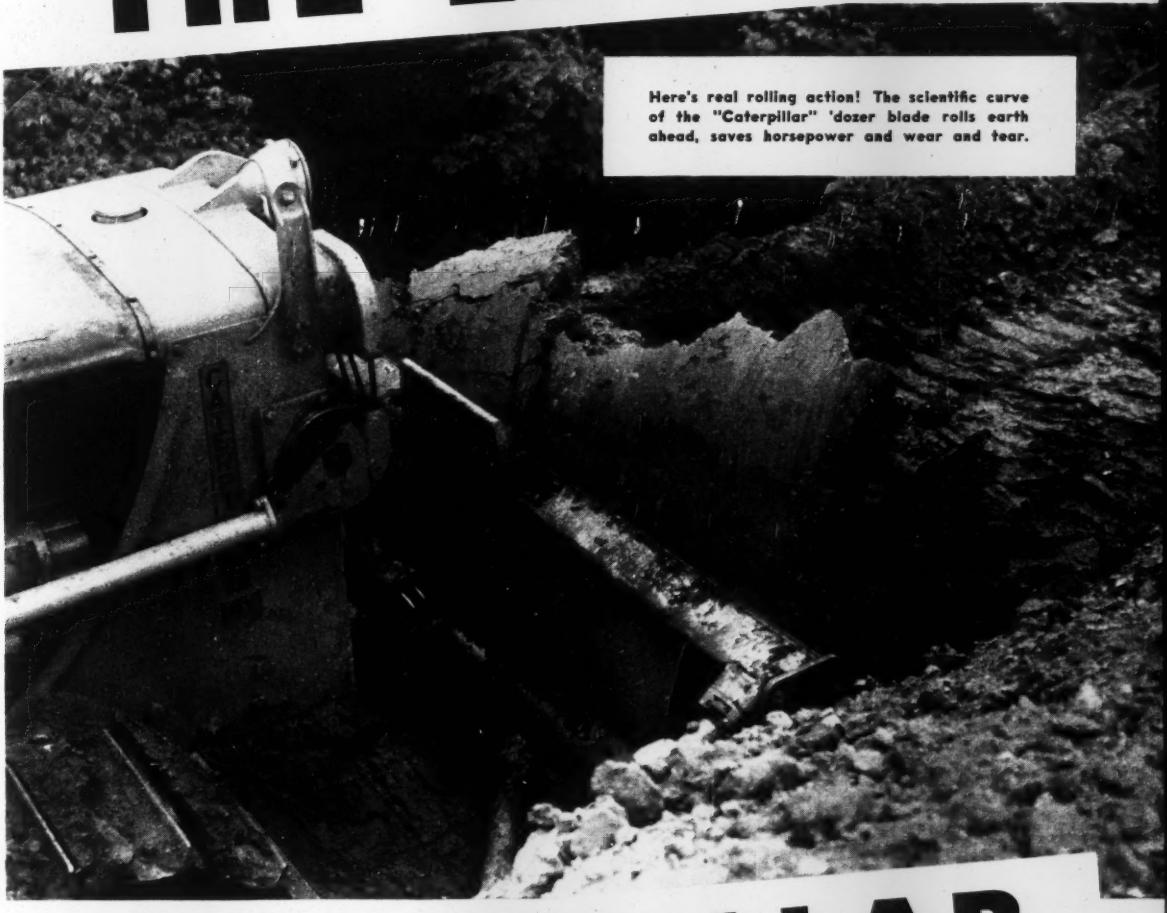
'Dozers THE EARTH



Here's real rolling action! The scientific curve of the "Caterpillar" 'dozer blade rolls earth ahead, saves horsepower and wear and tear.

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"SETS PIPE AS FAST AS BIG MACHINES — AND SAFER"

Says Milwaukee Contractor

"Bucyrus-Erie Hydrocranes set pipe just as fast as big machines and are safer for trench workers because of their precision control," says D. R. Tomasini, partner in the contracting firm of Tomaro, Carle and Tomasini, Milwaukee, Wis. "Our Hydrocrane has set thousands of feet of pipe in the past two years at the rate of 200 to 300 feet per day — sewer pipe ranging from 15 to 36 inches in diameter — water pipe from 6 to 16 inches. In addition, we use it with a clamshell bucket for digging pipe trench, ditching for culverts, and for loading material in the yard.

"Our Hydrocrane proved a real money saver on the big 3rd Street widening job. Water pipe had to be set between two lines of gas pipe. Only the Hydrocrane was able to dig between the pipe. Without it, expensive hand labor would have been needed. It's a mighty handy rig for tight quarters."

The truck-mounted Hydrocrane travels up to 50 m.p.h. on good open highway. It is fully hydraulic, simple to operate—hand levers only. Compact — works in close quarters and under overhead obstructions. Hydrocranes have wide utility — are available with clamshell bucket, grapple, trash bucket, magnet, and catch basin bucket. Two models — ¼ yard, 2-ton H-2 and ⅜ yard, 3-ton H-3. Send the coupon today for full details.

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(Shown: USG Metal Edge Plank and deck of Texlite, Inc., Metal Fabricators, Dallas, Texas. Grayson Gill, Dallas, architect. O'Rourke Construction Co., Dallas, general contractor. Macatee, Inc., Dallas, roof deck contractor.

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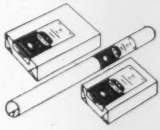

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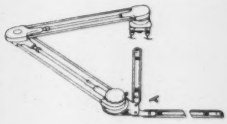

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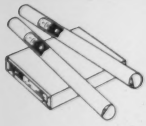
Actual tests prove they save up to 40% of the draftsman's time. Fewer motions are needed: these machines combine T-square, scales, straightedge, triangle, and protractor into one precision instrument. Six models available.



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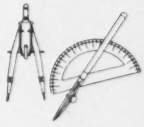
Every type of tracing medium required in the modern drafting or engineering department is available from Bruning. These products have proved their service-ability over many years in making better tracings and prints.

Bruning Erasing Machines

This new machine saves valuable time erasing pencil, ink, typing, carbon copy, and other marks. A 7-inch eraser is housed in motor shaft. Quiet, vibration-free and cool. An efficient tool for all departments within your firm.

Drafting Room Furniture

Bruning provides a complete line of drawing tables, drawing boards, filing cabinets, stools, etc. The functional design of each provides for easy, efficient use. Strongly built to give a long life of hard and steady service.



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A large variety of ruling pens, beam compasses, bow instruments, and industrial drafting sets are available from Bruning. Drafting tools such as protractors, curves, triangles, T-squares, pantographs etc., are also featured.

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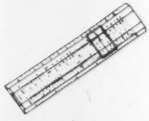
If it is a drawing material used in a drafting or engineering design department—Bruning has it . . . and you can be sure that it is right in every detail. You can rely on the name "Bruning" for uniformly high quality.



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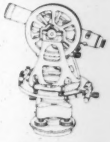
Bruning Slide Rules are precision tools. They are graduated to exacting tolerances, with precise graduations that do not lose their excellent visibility. Construction throughout is to typical high Bruning standards of quality.



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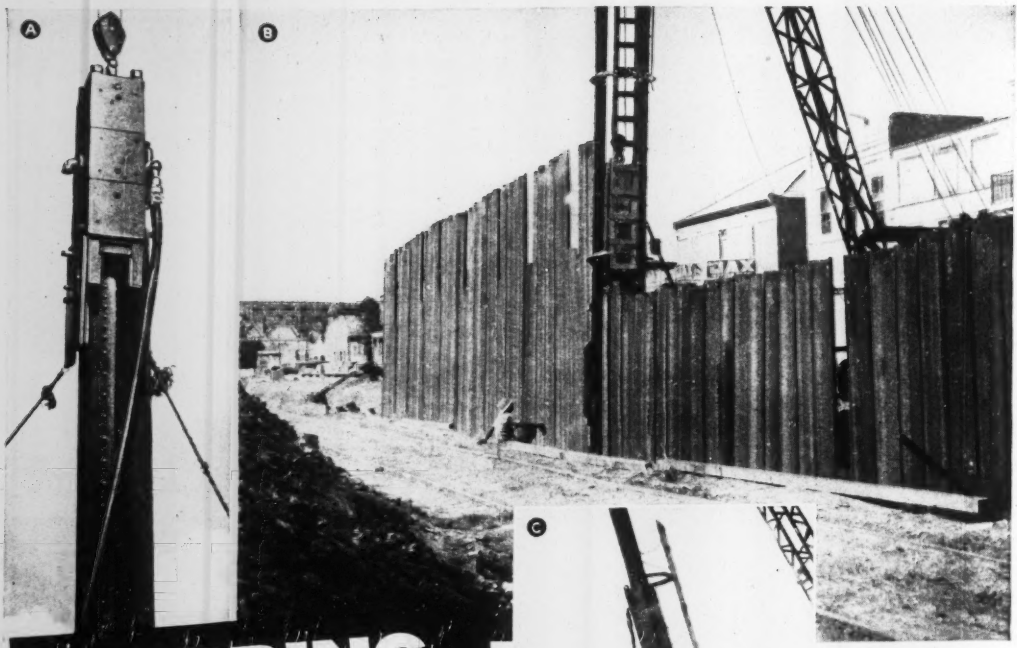

CURBING The Treacherous Atchafalaya

Three times since the turn of the century has the Atchafalaya River, torrenting past Morgan City and Berwick, La., devastated those cities with heavy floods. Now new, strong floodwalls on both sides of the river provide instant protection from rising waters.

To drive the heavy steel sheeting and timber batter piles for these floodwalls McKiernan-Terry Double-Acting Hammers, a 9-B-2 and a No. 7, were the contractors' choice.

Engineers and contractors know they can always secure the right hammer for any specified pile-driving need in the McKiernan-Terry line. A choice of ten standard sizes in Double-Acting Pile Hammers, five sizes in Single-Acting Hammers and two Double-Acting Pile Extractors.

(A) Berwick, La. McKiernan-Terry Double-Acting Pile Hammer, in "pants" guide, driving foundation piling for the new floodwall. (B) McKiernan-Terry Hammer driving 20-ft. steel sheet piling for the Morgan City floodwall. (C) Driving timber batter piles, to care for the overturning moment, Morgan City. *Contractors: Morgan City, Keller Const. Co. Berwick, Hendry Corp. Photos courtesy U. S. Engineers.*

FOR FURTHER INFORMATION

Write for latest literature giving specifications, special advantages and other data on McKiernan-Terry Pile Hammers, to keep on file for handy reference.

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Coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment are among the many other important products of McKiernan-Terry engineering and manufacturing skill, performing important service to industry, the railroads and our government.

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McKiernan-Terry PILE HAMMERS AND EXTRACTORS

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(Chromated Zinc Chloride)

Gives even longer-lasting all-round protection

Now—timber and lumber can have even greater service life than has been obtainable with standard CZC (Chromated Zinc Chloride) treatment. New Du Pont *Copperized* CZC—backed by ten years of laboratory research and field testing—gives promise of being the best all-round salt-type wood preservative ever developed.

In addition to showing far greater preservative effect than standard CZC (Chromated Zinc Chloride), this outstanding new *Copperized* product offers all these same advantages:

- Decay resistance
- Termite repellence
- Fire retardance
- Cleanliness
- No odor
- Safe to handle
- Easy to paint

THESE 6 SIGNIFICANT TESTS SHOW ITS EFFECTIVENESS

1. Leach block test
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Clip coupon for more facts *on new Copperized CZC. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Delaware.*

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Please send me more facts on new Copperized CZC.

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Good News for Blasters!

THE ROCKMASTER 16 Blasting System is *new*. And it's good news for blasters. *Now*, Atlas brings you a *sixteen-stage* milli-second delay system that cuts noise and vibration as much as 60% . . . gives you better breakage that reduces the cost of handling and milling rock.

There's more to this story. ROCKMASTER 16 helps you produce more material per pound of explosive . . . gives you more footage per round. *Sixteen* periods—a wide choice of short or long milli-second delays—add up to better control over throw, back-break, and material size. *Sixteen* delay periods fire within 550 milli-seconds!—there's less strain on timbers and roof . . . less dust and a quicker return to the face.

From pits, quarries, underground workings, and construction jobs we hear that ROCKMASTER 16 cuts drilling and secondary shooting . . . saves on time, labor, and dynamite. No wonder they're saying "*ROCKMASTER 16 is the greatest improvement in blasting methods since Atlas introduced milli-second blasting in 1945.*" Ask your Atlas representative to show you where ROCKMASTER 16 fits into your operations.

ROCKMASTER 16 TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

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The life of any truck depends upon many things.

It depends upon the miles the truck is driven; on the care taken to keep it in good condition.

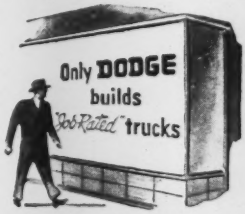
But more than all else, truck life depends on how closely the truck *fits* the job it must do.

Dodge "*Job-Rated*" trucks last longer, and at *low* maintenance cost . . . because they *fit the job.*

It stands to reason that you waste money with a truck that's too big for its job; or, if your trucks are too small for the job, you're in for plenty of costly maintenance expense . . . and early replacement.

From 248 basic chassis models your Dodge dealer can specify a truck that will be "*Job-Rated*" exactly for your hauling job.

Such a truck will have the right one of 7 great truck engines . . . "*Job-Rated*" for top efficiency and economy. It will have the right units throughout . . . to haul *your* loads, over *your* roads.

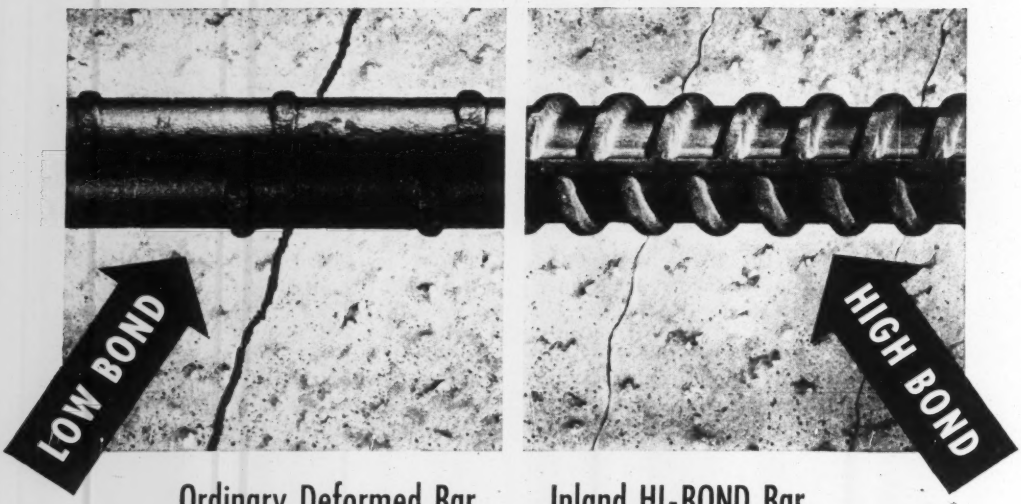


And remember . . . only Dodge builds "*Job-Rated*" trucks. Talk to your Dodge dealer!

For the good of your business—

Switch to DODGE "Job-Rated" TRUCKS

Here's Why HI-BOND Reinforcing Bars Prevent Unsightly Cracks in Concrete



Ordinary Deformed Bar Inland HI-BOND Bar

Wide cracks in tensile-stressed concrete, which mar structural beauty and allow reinforcing-bar corrosion, can now be prevented by the use of Inland HI-BOND reinforcing bars. This has been proved by National Bureau of Standards tests which show that the greater the bonding efficiency of the reinforcing bars used, the smaller the width of cracks.

Inland HI-BOND has *superior* bonding strength because its deep, reversed, double-helical ribs anchor firmly in the concrete. By preventing slipping, HI-BOND eliminates wide cracks and permits more efficient and economical structures.

Specify HI-BOND for your next concrete reinforcing job. This superior bar *more than meets* the requirements of the new ASTM Specification A 305-47T covering reinforcing bars. Write for complete information on Inland HI-BOND.

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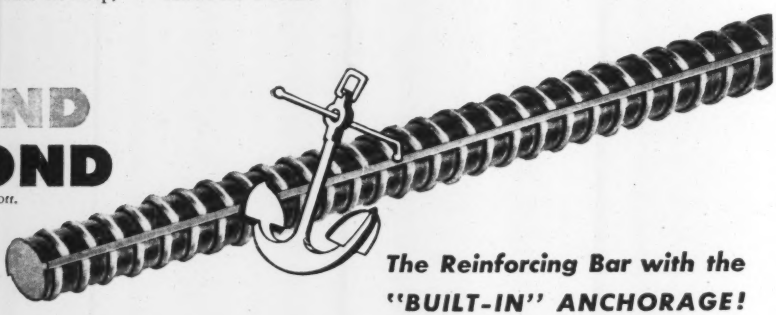

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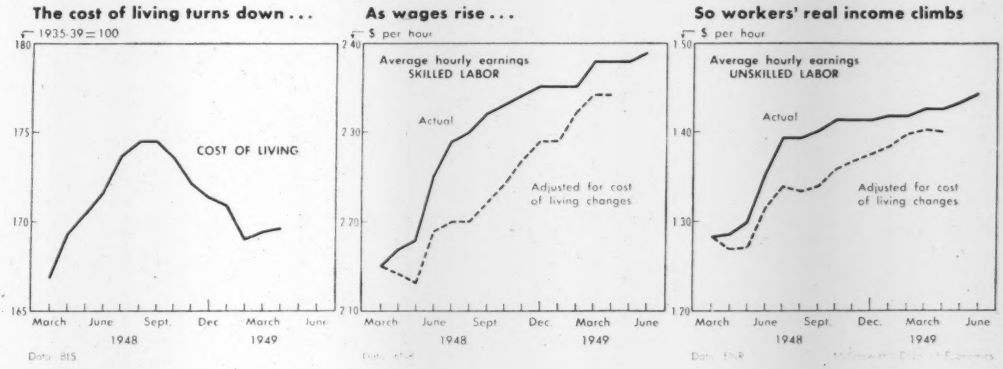


Construction workers scored a real gain in wages in the last year.

With the cost of living just about what it was a year ago, and wages rising 10 percent, skilled workers have 9 percent more real purchasing power than they did a year ago. Common laborers on the same basis also have a gain of 9 percent in their real purchasing power.

The chart above tells the story. It shows the trend in wage rates for skilled and common labor adjusted for changes in the cost of living. The wage rates are averages of rates in twenty cities as reported to ENGINEERING NEWS-RECORD. The first section of the chart shows the trend of the Bureau of Labor Statistics' consumers' price index. From 169.3 in April last year, it climbed to 174.5 in September. Then it dropped for five months in a row, reaching 169 in February. Rising food prices brought it up to 169.7 in April—just four-tenths of a point above what it was a year ago.

The second and third sections of the chart show changes in wage rates and how they look after being adjusted for changes in the price index. That measures the real gain in purchasing power.

Because the cost of living has held level, this is the first year since before the war when rising prices have not taken a sizeable bite out of the gains in purchasing power labor has won through annual wage increases.

The prospects for a real gain in construction workers' purchasing power in the year ahead are even better. Food prices are expected to turn down again. Other things—clothing, house furnishings—are going lower. The prospect is that the price index by the end of the year will be under 160—between 160 and 155. To put it another way, prices will probably drop another 5 percent to 8 percent. Even in cases where workers do not get a wage increase—as in Pittsburgh recently where 5,000 carpenters agreed to forego a 25-cent increase—drop in living costs will mean a boost in real income.

Workers in the unions that are winning increases this year—and they would average 10 to 15 cents an hour—have in prospect a gain in living standards of, say, 15 percent—when they take declining living costs into account.

Meanwhile an ENGINEERING NEWS-RECORD survey shows that workers' productivity is rising. Contractors report that their men are turning out more work in each hour.

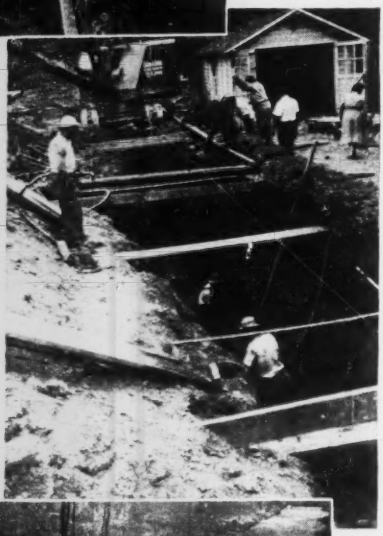
The gain in workers' productivity—plus gains in productivity from a smooth flow of materials and from new materials and methods—is helping substantially to bring down construction costs. Better productivity on the part of workers alone should offset the cost of wage increases for most contractors. One result is that, with costs stabilized, many projects that had been shelved are now being started.

As yet, the gains in productivity and cost savings have perhaps been most dramatic in residential construction. Contractors have reported cuts in house prices ranging up to 15%—and they are building better quality homes. One reason for the sharp gain in housing is that lumber, which makes up a large part of home-building materials, has come down more in price than other materials. But better productivity is having a marked effect on almost all construction.

These gains in productivity have been fairly easy to make, however. The end of shortages of steel or skilled workers alone has knocked off many extra costs and pushed jobs through faster. The real challenge to contractors—and to leaders of construction trades unions—is still to come. It is to steadily push productivity higher—and so to bring costs down, maintain wages and employment, and still keep contractors in the black.

1. Installing wellpoint system.

LIVINGSTON SEWER PREDRAINED PERFECTLY BY MORETRENCH WELLPOINTS



2. Excavating and laying sewer pipe — "in the dry" — one day after system started operating.

3. One day after job was finished and wellpoint system disconnected.

The Contractor Writes:

"The section where we used Moretrench Wellpoints was in a very low and swampy area where sheeting and pumping were most impractical, if not impossible.

"Your wellpoint system worked out most successfully for us, and we thank you for your fine service and cooperation."

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THE CONSTRUCTION WEEK

NO CHANCE FOR AUTHORITIES — Despite desultory Senate hearings, and despite the administration's constant plugging, observers concede there is no chance at all now for any new valley authorities—Missouri, Columbia or anywhere else. Bitter opposition in both houses of Congress isn't the only reason; a more impelling one is the fact that matters of higher priority will simply crowd out the valley authority measures between now and the adjournment of Congress. There might be a chance next session, if a real need for pump-priming (ENR June 2, p.5) should develop.

PRESTRESSED AIRSTRIP—Following the lead of French engineers at Orly, near Paris (ENR Sept. 16, 1948, p.104) Britain will build an experimental airstrip of prestressed concrete at London's huge Heathrow airport. The strip will be 120 ft. wide and 343 ft. long. Roller joints will be formed along lines at 45 deg. to the longitudinal axis, and a precompression of the concrete slab in this direction will be induced by transverse prestressing, no longitudinal wires being necessary.

CUTTING OVERTIME—A bill that will give all industry, retroactively, protection from "overtime on overtime" is being rushed through Congress for the President's signature. Containing Senate amendments to the original House measure (which covered only longshoremen and the construction industry), the bill has already been approved by the House Labor Committee. Under the new measure, time and a half pay for night, holiday or week-end work will be counted as overtime pay under the requirements of the wage-hour law. But the extra pay will be excluded in computing the regular hourly rate.

PUBLIC HOUSING SEEN SURE—There won't be any holdup in federal measures to authorize public housing and slum clearance. Evidence: After the Senate had approved federal rent subsidies for 810,000 dwelling units to be built in the next six years, a House committee went further and approved 1,050,000 units to be built in seven years. Both measures would authorize a five-year slum clearance program, finance by $1 billion in loans and $500 million in grants. Both congressional houses also agree on an expanded program of research, a housing census in 1950.

NO HELP PROBLEM—The Bureau of Labor Statistics thinks employers won't have much trouble finding workers to fill jobs this summer. Statisticians point out that the colleges have dumped more than 300,000 graduates into the labor market—this at a time when there are more than 3,000,000 unemployed.

OLDS STAYS—Despite vigorous opposition from natural gas interests, Washington thought last week that President Truman would re-appoint Leland Olds to the Federal Power Commission. Pundits believe the president will decide Olds is too important a symbol in the fight for public power to be dropped now.

HOOVER REPORT BOOSTED—The somewhat disorganized Congressional chase after anything that sounds like government economy is giving an unexpected boost to the proposals of former President Hoover (ENR March 24, p.9). The shining objective to many legislators is Hoover's constant reiteration of his belief that implementing his proposals would save $3 billion—a statement with an attractive ring right now. Actually, you don't get economy just by passing the laws necessary to put the Hoover program in effect, but congressmen can take comfort from the fact that they've at least told someone else to save. A measure of the progress of the proposals includes: The State Department has already been granted power to unify the career service and the departmental staff; the Senate last week voted real management powers to the Defense Secretary; the McClellan Bill, giving the President authority to re-shuffle agencies will probably go to Truman soon; and Congress has now before it the "housekeeping" bills to centralize buying and disposal of government property, that Hoover says is basic to real economies.

PREFAB PERFORMANCE—One of every 25 new permanent single-family dwellings started last year (in non-farm areas) was a prefabricated house, the Prefabricated Home Manufacturers' Institute said proudly last week. U. S. prefabbers shipped 30,000 permanent-type homes during 1948.

BAD HABIT—Despite the fact that the recent Pacific Northwest earthquake did most damage to poorly-built chimneys, most householders are having their chimneys rebuilt exactly as they were. In Chehalis, Wash., 1,351 chimneys needed repair after the 'quake. Almost all are being rebuilt to original specifications.

THREE ON THE AISLE for 'TOP PERFORMANCE'

These tickets are typical of the many that W&T Equipment must *earn* during production. They are evidence that keen-eyed inspectors have tested and re-tested each part before accepting it for *your* job. They are thus your passes to "TOP PERFORMANCE" — the hit show of proven, dependable and economical chlorination in which W&T Chlorinators have starred for over 35 years.

It's no wonder that the show is a steady hit. Take a look at the "producers" background:

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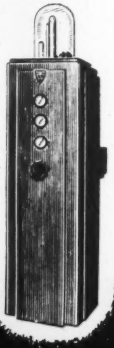
W&T manufacturing facilities are equipped to handle, in stride, the precision required in chlorinator manufacturing.

W&T engineers select equipment from a complete line of chlorinators, hand tailor it to each job and then test it under actual job conditions before shipment.

W&T's field organization is conveniently located and always available to supervise the installation of equipment and render prompt service and technical assistance.



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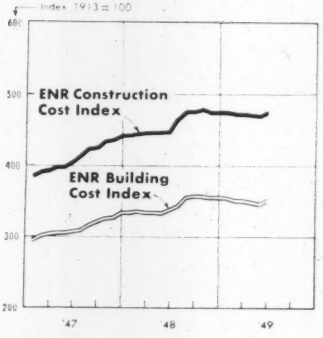
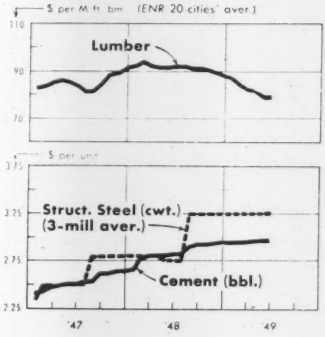
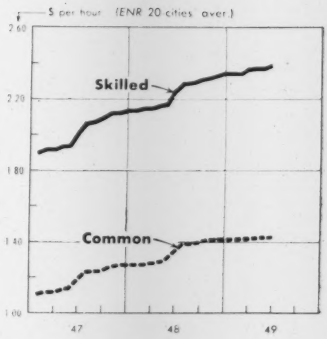
JUNE CONSTRUCTION BUSINESS REPORT







ENR INDEXES (1913 = 100)	June '49	May '49	% Change	June '48	% Change
Construction Cost	173.78	172.10	+0.3	111.86	+ 6.5
Building Cost	349.28	348.92	+0.1	333.93	+ 1.9
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl.	$2.960	$2.990	−0.1	$2.750	+ 7.6
Structural Steel, (3-mill aver.), per cwt.	3.250	3.250	0.0	2.750	+18.2
Sand, per ton	1.978	2.005	−1.3	1.918	+ 3.1
Lumber, 2x4 Fir, per M ft. bm.	86.382	86.320	+0.7	96.930	−10.9
Lumber, 2x4 Pine, per M ft. bm.	73.803	73.930	−0.1	88.910	−16.9
Common brick, per M	27.769	27.769	0.0	25.938	+ 7.1
Ready-mixed concrete, per c.y.	10.205	10.211	−0.06	9.921	+ 2.8
Structural Clay Tile, 3x12x12 per M	131.608	131.608	0.0	125.330	+ 5.0
WAGE RATES (20-cities average)					
Common	1.111	1.131	+0.7	1.35	+ 6.6
Skilled (aver. 3 trades)	2.391	2.384	+0.1	2.250	+ 6.4
Bricklayers	2.619	2.606	+0.5	2.406	+ 8.9
Structural Ironworkers	2.356	2.356	0.0	2.268	+ 3.9
Carpenters	2.207	2.188	+0.9	2.065	+ 6.9

CONTRACTS AWARDED (thous.)	May 1949	May 1948	% Change†	Five Months 1949 (21-weeks)	Five Months 1948 (22-weeks)	% Change†
Total U. S. (ENR reported)	$601,709	$535,184	+12	$3,063,841	$2,737,037	+17
Private	253,959	217,018	+ 3	1,475,756	1,293,540	+19
Public	347,750	288,166	+21	1,588,085	1,443,497	+15
Federal	71,285	61,522	+10	333,913	168,916	− 3
ENR Const. Volume Index, '13 = 100	275	259	+ 6	264	242	+ 9
NEW CONSTRUCTION CAPITAL						
Total	518,526	321,096	+69	2,207,412	1,548,522	+19
State & Mun. Bond Sales	305,216	179,623	+69	1,119,715	700,503	+67
Corporate Security Sales	213,310	141,473	+68	1,087,697	848,019	+31
Federal (non-federal work)	.....	.....	.....	.....	.....	.....
Federal (federal work)	.....	.....	.....	.....	.....	.....

MATERIAL SHIPMENTS & LABOR SUPPLY	April (A) March (M) 1949	April (A) March (M) 1948	% Change	Four Months Three Months 1947	Four Months Three Months 1948	% Change
Cement, thous. bbls., Bu. of Mines	11,539 (M)	13,957 (M)	+ 1.1	32,129	31,500	+ 3.0
Fabr. Struct. Steel, thous. tons, AISC	174 (A)	167 (A)	+ 1.2	659	622	+ 6.0
Lumber, mil. ft. bm., NLMA	2,526* (M)	3,021 (M)	−16.3	6,659*	8,432	−21.0
Lumber Prod., mil. ft. bm., NLMA	2,656* (M)	3,022 (M)	−12.1	6,937*	8,221	−15.6
Contract Const. Employ., thous., BLS	1,965 (A)	1,933 (A)	+ 1.7	7,477	6,845	+ 9.2

†Computed on weekly average basis. * Revised.

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A Code Change That Counts

So much is being said these days about the need for modernizing building codes in the interest of lower-cost construction and so little is being done that it is refreshing to be able to report one major change in a building code that holds possibilities for large economies. The change is the one made in the New York City foundation piling code (ENR, May 26, p. 56). That code now bases the working load allowance on load tests instead of on a pile formula and an arbitrary limit.

Load tests have been used before, but only as a check on carrying capacity within the arbitrarily prescribed limit. Now, in New York City, when the job is big enough to warrant careful subsurface exploration and load testing, working loads can be very materially increased over those heretofore permitted, thereby making possible large economies in the foundation work. Very comprehensive safeguards are included in the new code. As now written, this section of the city's building code has become an engineering document, not an arbitrary limit. Many other sections could stand similar treatment.

Noteworthy also is the fact that this change was made possible by limiting the change to one section of the city's building code instead of trying to rewrite the whole code at one time. When the latter is undertaken, opponents to a change in one section will object to changes in other sections just to reduce the chances for any change being made. But when piecemeal changing is undertaken, each proposed modification stands on its own merits. This is a lesson that those interested in code revision in other cities can learn with profit.

Soils Pollution in Streams

Soils and natural contamination rank with industrial and domestic wastes as sources of stream pollution. Due to sustained educational and publicity programs, most people know that discharge of untreated industrial and domestic wastes menace human health and welfare as well as cause destruction of aquatic life. They do not, however, appreciate either the extent or damage caused by soils and natural pollution.

Abstracted in this issue is a report on the costs and losses incurred by excessive turbidity in the Potomac River. Among the findings are: (1) an estimated 30,000,000 cu. ft. of top soil above Washington is washed away annually; (2) a great portion of valuable fish life is snuffed out; and (3) water-treatment costs at Washington could be cut more than $50,000 per year if turbidity is reduced 75 percent.

The significance of this study is this: Erosion is not only seriously depleting our agricultural resources but it is also a powerful contributant to stream pollution. Thus the cooperation and whole-hearted support of the nation's farmers must be enlisted along with that of industry and municipalities to abate pollution in our streams and rivers successfully. It is not only the industrial streams that need cleaning up. All streams that carry sediment of any kind demand attention.

To Study Local Roads

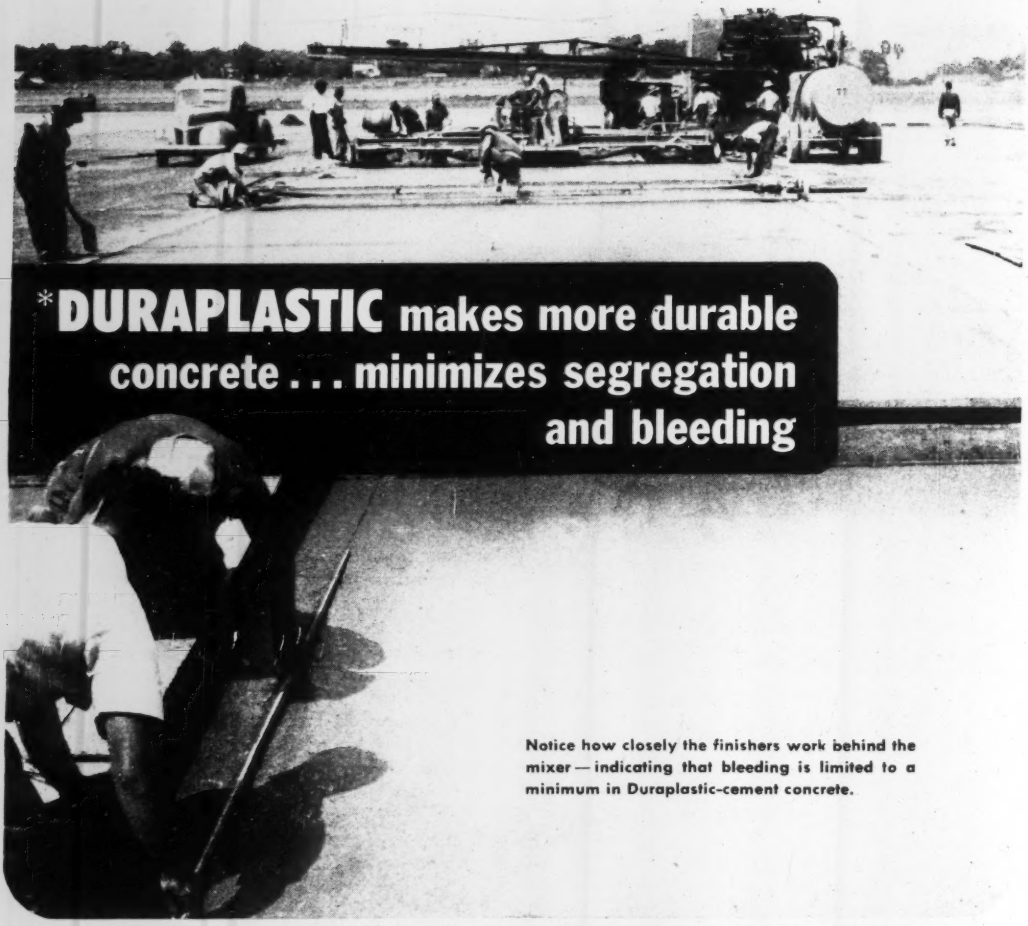
The public roads administration has been asked by the Public Works Committee of the Senate to make a thorough study of local rural roads and to report its findings. This is the latest development in efforts to get Congress to extend federal aid to more roads than are now covered by the authorized program of federal aid to primary highways and principal secondary roads.

Such a survey is very desirable, for Congress certainly should not act to extend the federal-aid program without more facts than it now has. By the time Congress comes to take up the regular federal-aid program next year the PRA will be able to tell how many miles of rural roads would be covered by the aid bills now in the legislative program (ENR, May 12, p. 51) and roughly what it would cost annually to make a local road aid program effective.

It hardly appears probable that the PRA will change its views as to the undesirability of federal aid to rural roads as a result of this study. Thomas H. MacDonald, the administrator, pointed out very convincingly at the recent hearings that local rural roads are of necessity only lightly surfaced, hence regular and efficient annual maintenance is much more important than first cost. Consequently, if the money Congress contributed to the first cost of reconstructing such roads is not to be wasted, Congress would have to be sure that the counties and townships keep up those roads by proper maintenance, or it would have to contribute annually to the maintenance cost. All of which would be wasteful and would involve a vast amount of costly supervision.

It can be expected therefore that the PRA will recommend against federal participation in rural road work when it reports next year.

However, as the National Highway Users Conference points out, this request for a study by the PRA does not mean that further action on the local-road legislation is out for this year. The proponents of the legislation have considerable support, and might yet get Congress to approve the rural-road aid. If that should be done a serious blow would be dealt to our present sound road program. Also a more certain way to scuttle any attempt at federal economy can hardly be imagined.



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Notice how closely the finishers work behind the mixer — indicating that bleeding is limited to a minimum in Duraplastic-cement concrete.

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ENGINEERING NEWS-RECORD

JUNE 9, 1949 VOL. 142 NO. 23

USBR land drainage plan rebuffed by Texas farmers

Reclamation Bureau's move toward land drainage operations may push Congress to set national drainage works policy—Landowners cool to 160-acre limitation

Reclamation's first effort to expand its operations into land drainage has met with considerable coolness from Texas farmers who would be local participants in the scheme. Fundamentally the local resistance seems to rise from the requirement in basic U. S. reclamation law that land holdings in projects receiving federal help be limited to 160 acres per owner—or 320 acres for man and wife.

Interior Secretary Krug recently approved a Reclamation Bureau report that sets forth the engineering and economic feasibility of draining 117,000 acres in the Big Creek area of the Texas coastal plains. Pulling the Army Engineers and Agriculture into a drainage proposal for the first time, the report suggests a basis on which to establish a national policy for drainage works.

Despite the economic feasibility of the project—and a favorable benefit-cost ratio of nearly 9 to 1—both Mr. Krug and Reclamation Commissioner Straus recommend that Congress do nothing toward authorizing the work for the present. Their letters propose that Congress wait until local interests show a willingness to repay the costs of the project.

Many big landowners

Causes of the local reluctance are not hard to find. Land ownership figures—in the project report of December, 1948, by the reclamation director of Region V, Amarillo, Tex.—supply the answer. Total land area in the Big Creek basin comes to 175,000 acres, of which the 117,000 acres proposed for drainage are in crop lands or pasture.

Ownership data given in the report are for the total 175,000 acres of land area.

They show 51 percent is in units exceeding 320 acres in size and 16 percent in the range from 161 to 320 acres. In all, 67 percent of the basin area is held in units that exceed the 160-acre limitation imposed by reclamation law.

Landowners of the Big Creek Basin—in the Brazos River watershed south and west of the Lower Brazos—are organized in the Coastal Plains Soil Conservation District. In January, 1947, the board of supervisors of the district voted to ask the Reclamation Bureau for a detailed engineering-construction study. By January, 1949, local sentiment had reversed itself. In that month the board chairman wrote to Reclamation that the supervisors saw no reason for the bureau's continued consideration of the project. That is the basis for the recommendation—by both Mr. Krug and Mr. Straus—that Congress wait for a change of heart on the part of local interests in this matter.

In the Big Creek drainage plan proposed by Reclamation, the Agriculture Department would give technical assistance to individual farmers, who—at their own expense—would build such works as would be needed to get excess water off their lands to drainage outlets. The scheme calls for an outlet to serve every 300 acres.

From the farm outlets to the major drainage channels, an intermediate disposal system would be financed and constructed—on a reimbursable basis—by the Bureau of Reclamation. Improvements required in the major drainage channels would continue—as at present—to be a responsibility of the Corps of Engineers.

At April, 1948, prices, the estimated total cost of the drainage project—exclusive of rights-of-way—comes to $2,660,000. The report points out that the entire cost of the project must be charged to the account of land drainage.

It stresses the total cost should be repaid to the government by the landowners benefited.

Federal reclamation laws already on the books furnished the necessary authority under which the bureau made its investigation of the Big Creek drainage scheme. But, because the proposed construction is exclusively for drainage—not covered by existing laws that govern the activities of the Reclamation Bureau—Congress would have to pass a special act to authorize the project under the plan. If so minded, Congress could at the same time broaden its action to declare a national drainage policy.

Highway promotion scheme gets results

First promotion effort in its field, the 1949 National Essay Contest of the American Association of State Highway Officials produced real results. That much was evident this week when Carl W. Brown, AASHO president and Missouri State Highway Engineer, announced the winners. As many as 50 entries had been received from a single school, and a total of 53 engineering schools participated in the nationwide competition.

Designed to stimulate the interest of future civil engineering graduates in highway engineering careers, the contest was set up in two parts—a student division for junior civil engineering students and a faculty division for members of the civil engineering faculties. The winner in the student division is Michael Lash, Jr., Tufts College, Medford, Mass. In the faculty division, the prize goes to Emmett H. Karrer, professor of highway engineering, Ohio State University, Columbus, Ohio.

Competition in the contest was based on two topics: "What I Think of Highway Engineering as a Career"—for the student division, and "What I Advise My Student with Regard to Highway Engineering"—for the faculty division.

Winners of the national award will receive an all-expense trip to the 35th annual meeting of the American Association of State Highway Officials in San Antonio, Tex., October 10-14. They will present their winning papers before a general session of that meeting; later the winning papers will be published.

NEWS BRIEFS

Natural Gas Pipeline—The Federal Power Commission has authorized construction of a $4,000,000, 85-mile natural gas pipeline in southern California, from a connection with an existing line near Moreno to San Diego. The San Diego Gas and Electric Co. will construct 50 miles of line in San Diego County, and the Southern Counties Gas Co. of California will build the remaining 35-mile portion in Riverside County. FPC ordered the companies to complete construction by Dec. 31, 1949.

Apprenticeships — In a statistical study recently issued by the Bureau of Apprenticeship, U. S. Department of Labor, it is revealed that the largest number of apprentices at the beginning of this year was in the carpentry trade—38,700. In the plumbing and pipefitting trades 20,200 apprentices were reported; and in brick, stone and tile laying, 9,500.

To Start Texas Dam—Construction work on the proposed $30,000,000 Texarkana dam and reservoir, in northeast TEXAS, is to begin in July with bids for the work to be received up to June 9. The project calls for 2,450,000 cu. yd. of compacted embankment, 137,000 cu. yd. of riprap, and construction of a two-mile maintenance road. This is the first of six reservoirs planned for Red River Valley flood protection by the Corps of Engineers.

Distribution Plant—The Texas Co. has purchased 25 acres of harbor property in RICHMOND, CALIF., and will construct a $3,000,000 plant to handle distribution of its oil products.

Bridge Over Susquehanna—Governor James H. Duff has approved a Pennsylvania legislature appropriation of $5,500,000 for a toll-free bridge across the Susquehanna River between HARRISBURG and WORMLEYSBURG. After the free bridge is opened, the state is expected to buy two existing toll bridges in the vicinity.

Pollution Control Law—Ohio's legislature has passed a bill prohibiting discharge of untreated sewage and industrial waste into Ohio waters. Violations are subject to a fine of $500, and each 30 day period of violation constitutes a separate offense. The bill is intended to tie in with efforts of the Ohio River Valley Water Sanitation Commission.

HARTFORD MEDICAL BUILDING has been completed as a new wing (left, above) added to the Hartford (Conn.) Hospital by The Connecticut Mutual Life Insurance Co. Builder Robert Glenn, of Hartford, constructed the office-space wing from plans by Robert Loomis, structural engineer, and Moore and Salsbury, architects. The eight-story structure will provide offices for about 100 doctors, plus laboratory space. Of steel frame construction, the building has white, glazed brick facing, backed with cinder block. All ducts, wiring and plumbing run in space above suspended ceilings.

Kansas City Floodwall—Col. P. D. Berrigan, district engineer, Corps of Engineers, at Kansas City, Mo., has announced the awarding of a contract for $3,126,139 to the Massman Const. Co., Kansas City, Mo., for a floodwall, levee and related works along the left bank of the Kansas River at Kansas City, Kan., extending from mile 0.7 to mile 2.9 above the mouth. It calls for about 4,500 ft. of concrete flood wall from 41 to 24 ft., raising of 7,200 ft. of adjacent earth levee to correspond, and necessary drainage connections. The top of the floodwall and levee will be 2 ft. above maximum flood level expected after completion of the flood-control project.

Oak Ridge Shopping Center—The Atomic Energy Commission has announced plans for the development of an 108-acre tract as a shopping center for Oak Ridge, Tenn. Bids will be received until June 15 and then publicly opened. The work will include clearing, grading and construction of roads and parking areas and utilities.

Birmingham's Sewerage Plans—A report proposing a $10,000,000, 30-year bond issue to finance expansion of the "inadequate" sewerage system of Jefferson County, was handed to the county commission. The report, drafted by an 11-member Citizens Advisory Committee, recommended that the work be paid for by the present five-mill sewer tax on real estate and by a new sewer rental tax which would be levied against all users of the sewerage system. Based on a fixed percentage of water used, the tax would not exceed 50 percent of the water bill.

Pa. plans two pike spurs; Ohio may vote toll road

Pennsylvania Turnpike spurs into Scranton and Erie have been authorized in two bills signed by Governor James H. Duff recently. These new highways—to tie into the main east-west toll road at Harrisburg and New Castle—will not be undertaken until surveys prove their financial feasibility, the governor said.

Preliminary estimates place the cost of the 110-mile Scranton link at $100,000,000, and the 65-mile Erie extension at $50,000,000.

Turnpike Commission engineers said that preliminary engineering and traffic surveys on both proposed routes would be started shortly with funds provided by the state highway department.

Meanwhile, in Ohio, Governor Frank J. Lausche was expected to sign a bill creating a state turnpike commission with authority to plan, locate, and build toll turnpikes with funds to be obtained from revenue bonds.

Predictions indicate that Ohio's first toll road would connect with the western extension of Pennsylvania's turnpike, south of Youngstown, and run straight across the northern part of the state to the Indiana border. Other routes proposed would run from Cincinnati past Cleveland to near Conneaut, and from Bridgeport past Columbus, Springfield and Dayton to the Indiana border.

The proposed turnpike commission would consist of four members, appointed by the governor with consent of the state senate, and the fifth member, the state highway director.

AWWA hears drinking water cleared of charge of being polio virus carrier

Waterworks men meeting in Chicago give official OK to fluorides but say doctors must order this addition to water supplies

No evidence is available to show that public water supplies transmit polio virus. Data collected over 50 years prove drinking water unjustly accused as polio carrier.

Reporting on studies at Johns Hopkins University, Prof. Kenneth F. Maxcy told the American Water Works Association last week in Chicago that "all attempts to demonstrate the existence of polio virus in suspected drinking water supplies have so far been questionable or negative." Prof. Maxcy pointed out that there has been no convincing proof that sewage pollution of a community water supply was responsible for either direct or widespread exposure to the infection virus.

Waterworks men found this authoritative statement a basis for allaying growing public fears that polio might be transmitted through certain community supplies. It was recalled, for example, that during a recent outbreak of polio in North Carolina, motorists traveling through the state refused to drink water from local sources.

Fluorides for teeth

Another aspect of the relation of water supplies to health was featured at the meeting when the association took official cognizance of the addition of fluorides for the prevention of dental decay. Two years ago the group was faced with the problem of adopting a policy covering what was then termed "medication" of community water supplies. This stemmed from the finding that waters containing up to 1.0 ppm. of fluorides promoted sound tooth growth among young children.

The association's board of directors has now gone on record as favoring a policy that the responsibility for whether or not fluorides should be added to water supplies rests with medical, dental, health and legal authorities. The directors further stated that waterworks management should participate in approved programs for fluoridation.

Cost of fluoridation is estimated at 5 to 15 cents per capita per year. This additional cost is not a logical operating expense, says the report, and thus properly should be charged to community health services.

N. J. Howard, director of water purification in Toronto, Canada, reported that addition of fluorides would cost his city $100,000 a year. The benefits would extend only to seven percent of the population on the basis of human consumption in effective age brackets.

Ethics of the waterworks industry

"Consulting engineers occasionally complain that some manufacturers offer the equivalent of free consulting service," W. F. Rockwell (Rockwell Manufacturing Co., Pittsburgh) recalled. "It is a moot question as to how far a manufacturer should go in offering any so-called free services because every intelligent buyer knows

A. P. Black—New AWWA president

that free services are actually included in the price paid. Buyers, he said, must know that the manufacturer is prejudiced on value of his own products, and his recommendations cannot be rated as reliable as those of an independent and conscientious consulting engineer or operator."

Mr. Rockwell reminded his listeners that laws usually require all municipal purchases to be advertised and the order given to the lowest bidder. Such laws—erected as defense against graft and corruption—can be a serious handicap to intelligent buying with honest consulting engineers and operators. In addition, these laws provide a means by which tricky specifications can be applied by dishonest management to bar all but one manufacturer. Sometimes, he declared, goods and services are supplied at far higher prices than those currently submitted in other communities.

In the same vein, S. B. Morris, general manager and chief engineer, department of water and power, Los Angeles, said: "Frequently there are trade associations which tend to control prices and all bids will be found equal in spite of usual affidavits of non-collusion.

"Not infrequently, the unsuccessful manufacturer," Mr. Morris continued, "will complain of the award under such circumstances claiming favoritism. It should be apparent that when there is no free competition the waterworks manager is free to choose at will by flipping a coin, or favoring the concern giving the best service, or making a reasonable distribution of business, or making all awards to one manufacturer in an effort to break up the habit of identical bids. No bidder has a basis for complaint; he could get the job by a lower bid," Mr. Morris concluded.

Activated carbon replaces ozone

After five months of intensive experimentation—both on plant and laboratory scale, activated carbon is being applied at the rate of 1,200 to 1,800 lb. per mg. of water at Whiting, Ind., to eliminate highly objectionable tastes and odors in Lake Michigan water. All other oxidizing agents including ozone and chlorine dioxide proved incapable of producing palatable water, Leo Besozzi, consulting engineer, Hammond, Ind. and J. C. Vaughan, filtration engineer, department of public works, Chicago, said.

It is significant, they added, that a completely odor-free water could not be produced even by repeated distillation when using finished water previously treated with ozone. On the other hand, this could be done before ozone was applied. This finding has resulted in discontinuance of ozonation at the Whiting plant.

Officers and awards

New officers are: President—A. P. Black, professor of chemistry, University of Florida, Gainesville; vice-president—W. Victor Weir, general manager, St. Louis County Water Co. and Missouri Water Co., University City, Mo.; and treasurer—W. W. Brush, editor, Water Works Engineering, New York City.

The John M. Diven Medal for outstanding service to the association was presented to Harry A. Faber, research chemist, The Chlorine Institute, New York City. The John M. Goodell Prize, donated by ENGINEERING NEWS-RECORD, was awarded to Laurie M. Leedom, construction engineer, water department, Newark, N. J. for his paper on shut-down procedure.

Truman keynotes highway safety talks

Overall progress despite local reverses characterized the 1948 campaign against traffic accidents. Nationally, the accident rate declined, but the number of vehicle mishaps in rural areas and smaller communities went up. That fact points to the places where intensified preventive work is needed, the President's Highway Safety Conference was told last week at its third major meeting in Washington.

Two thousand delegates from all parts of the country attended the three-day meeting (June 1-3). They represented all levels of government and every type of private and public organization interested in prevention of traffic accidents. Without exception, they traveled to Washington under their own steam, with expenses paid out of their own pockets or by their local sponsoring groups. The attendance included 100 representatives from 32 foreign countries—participating as observers only.

President Truman spoke frankly to the conference. Departing from his prepared text, he rapped 23 states for easy licensing of drivers. He asked the conference delegates to help build up sentiment for tighter licensing systems in states where "the laws are pitifully weak."

In some states, the President declared, "the procedures for driver examination are scandalous." Again speaking extemporaneously, he went on: "I am sorry to relate that my great state of Missouri is still in that column. Terrible! Why, a man can go down to a drugstore from an insane asylum and spend a quarter and get a license to drive on any road in that state, if he wants to."

Before voicing those criticisms, he commended the delegates for developing programs that saved "almost 11,000 lives and prevented injury to nearly 400,000 persons" last year. Those losses, he explained, would have occurred if the accident rate had continued at the same rate as in 1946, when the conference convened for the first time in Washington.

The saving in 1948 was made despite a record of 32,000 deaths and 1,100,000 injuries to human beings as a result of motor vehicle accidents. With a 20 percent increase in both number of vehicles and motor mileage from 1946 to 1948, the losses would have been greater by the amounts the President mentioned if the accident rate of three years ago had persisted.

New regional groups

Separate sessions of five regional groups marked a new departure for this conference. Organized by geographical grouping of states in areas that have common traffic and highway problems, the regional units came into existence only a couple of months ago (ENR May 19, p. 16). Through these regional units, the Highway Safety Conference expects to get more concentrated and effective utilization of the standards and recommendations developed by its committees.

As at previous Washington meetings, the three general and eight technical committees of the conference work intensively on their special assignments at individual committee sessions. In general, their work consisted of refining, perfecting and vitalizing the comprehensive—yet succinct—reports in their special fields adopted by the initial 1946 conference. The reports of all the committees are summarized in the capstone "Action Now" program of the conference. This program report epitomizes all that is necessary for effective traffic safety in any locality—according to the judgment of conference officials.

The work of the engineering committee is representative of that carried out by all the committees. Of a total membership of 107 on the engineering committee, 74 made the trip to Washington to attend the committee session. In addition, 100 other highway engineers sat in on the proceedings.

This committee adopted a revised and improved report aimed at simpler, terser language, positive—rather than negative—statements, and better organization material.

Accident reporting was another phase of the safety program that got earnest attention during the conference. Records in many states and localities are lamentably weak and inadequate for proper diagnosis and cure of the accident evil. The committee on accident records declared "most cities and states are doing a very mediocre job in the field of collecting and utilizing accident records." It made strong recommendations to remedy this widespread and fundamental deficiency.

The revised report on the action program—a summary of the recommendations of all the technical committees—was prepared by the coordinating committee of the conference, with Commissioner Thomas H. MacDonald of the Public Roads Administration as chairman.

Maj. Gen. Philip B. Fleming, who this week left his position as administrator of the Federal Works Agency to become chairman of the U. S. Maritime Commission, will continue as chairman of the President's Highway Safety Conference—a post he has held since the creation of the conference in 1946.

MASON TRAINING PROMOTION—Ralph E. Yoder, right, accepts American Trade Association Executives' annual award on behalf of the Structural Clay Products Institute. The Institute's entry—one of 33—was its "Mason Training Promotion Program," aimed at overcoming industry's bricklayer shortage.

Pennsylvania plans for low-rent housing

In Pennsylvania a $15,000,000 state housing program has been set up. It is designed to speed up construction of homes for rent. The new laws provide for grants up to 35 percent of construction costs to either private or public groups.

Cities also may choose to use their share of the housing grants for slum clearance through metropolitan redevelopment authorities.

Governor James H. Duff says:

"We are developing a plan to provide home units renting from $50 to $65 monthly for the person who earns less than $4,500 annually. This we believe we have done through the grant of $15,000,000 in subsidies to successful low bidders among private capital, private builders or public housing authorities."

The program will be managed by a new state planning board composed of former members of the old planning board and the state housing board. Theodore Roosevelt, 3rd, the state's new commerce secretary, will head the board while the governor is expected to continue Francis Pitkin, as executive director of the new agency.

Suit filed in Cleveland on price fixing charge

Attorney General Tom C. Clark announced the filing last week of an anti-trust suit in federal court at Cleveland, Ohio, against fourteen building material dealers and one individual in the Cleveland area.

In its complaint, the Justice Department charges that the defendants unlawfully fixed and maintained the prices of hard building materials. They accomplished this purpose, the complaint alleges, by agreement among themselves to use a price list published by Harry A. DuBroy—an individual long active in the Cleveland building industry. The schedule of hard building materials includes about ninety items, comprising nearly everything that goes into houses except lumber and millwork.

The government has asked the court (1) to enjoin the publication and use of the price list and (2) to enjoin the defendants from resorting to any other devices that would result in price stabilization in the sale of hard building materials.

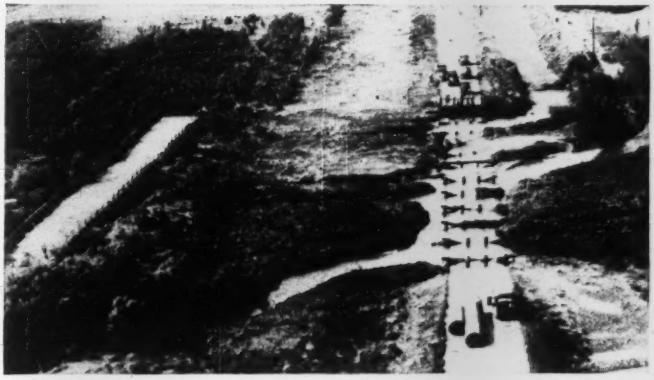
Defendants named in the complaint are: Harry A. DuBroy; Goff-Kirby Co.; Clifton Coal & Supply Co.; Collinwood Shale Brick & Supply Co.; Zone Coal & Supply Co.; St. Clair Coal & Supply Co.; Geist Coal & Supply Co.; Ideal Builders Supply & Fuel Co.; Queisser Builders Supply Co., Inc.; South Euclid Concrete Co.; Mayfield Builders Supply Co.; City Materials & Coal, Inc.; Pacific Builders Supply Co.; Cuyahoga-Dunham Supply Co.; and Breckling Coal & Supply Co., all of Cleveland, Ohio.

Ford to spend $1.5 million on waste treatment in '49

Ford Motor Company will spend over $1,500,000 on waste disposal installations at its Rouge plant during 1949. These new installations will be in addition to major disposal projects already completed at that and other Ford plants.

Among major units being added are an oil skimmer and facilities to dispose of waste steel pickling liquor. Oil recovered from waste waters will go through a reclamation process, facilities for which are now under construction. Waste steel pickling liquor is to be utilized for sewage treatment at plants in both Detroit and Dearborn, Mich. The liquor is used as a sewage sludge conditioning agent.

The overall program is being carried out in cooperation with the Michigan Stream Control Commission.



BRIDGE MOVES DOWNSTREAM—This 300-ft. timber bridge deck was not demolished; it simply floated 100 ft. out of line in a recent flash flood on Whitebread Creek, near Gracemont, Okla. (Wide World Photo)

PHS issues bibliography of refuse disposal data

The U. S. Public Health Service recently issued an extensive bibliography in refuse collection and disposal. Callis H. Atkins, chief of the Division of Sanitation, called it the most comprehensive ever compiled in this field.

Based on a study of twelve indexes and services, the bibliography refers to material published during 1940-48, arranged alphabetically by authors. It does not give abstracts of the articles.

Copies of the bibliography—"Refuse Collection and Disposal"—are being sent to engineering schools and to state and municipal sanitary engineers. Health departments also are expected to find the listing valuable. A request to the Surgeon General, Public Health Service, Attn: Division of Sanitation, Washington 25, D. C., will bring a copy. Compiled by Leo Weaver, of the Division of Sanitation, the 66-page publication lists nearly a thousand entries from U. S., British and other foreign periodicals. They include articles on street cleaning, garbage collection and incineration, garbage disposal with sewage (kitchen sink grinders), feeding of garbage to hogs, operation of sanitary landfills.

Ontario has $482 million power program under way

In a review recently released at Toronto, the Ontario Hydro Electric Power Commission is reported to have a $482,500,000 construction program under way. About $90,000,000 was spent on this program last year.

Main development now under construction is the Des Joachims generating station on the Ottawa River which is expected to start its initial four units in 1950 and the remaining four units in 1951. Capacity of the eight units will be 358,000 kw. and estimated cost is $75,000,000.

Chenaux generating station on the Ottawa River is to be in service in January, 1951, with capacity of 119,000 kw.—cost, $25,000,000. H. G. Acres & Co., Toronto, consulting engineers, are designing and planning this development. The contract for construction was awarded to Pentagon Construction Co. Concrete is now being poured.

Another Ottawa River development for the commission is the La Cave generating station, to start operating January, 1952, with two additional units to be added in 1953.

Engineer groups to survey Northwest 'quake damage

In an attempt to get exact scientific data on causes and particularly on effects of recent earthquakes in the Puget Sound area, local engineering groups announced formation of an evaluating committee.

The earthquake (ENR April 21, p. 11) hit a wide area of the Pacific Northwest and rather surprisingly did comparatively little damage.

The committee, appointed by the Puget Sound Engineering Council, will be headed by A. L. Miller, professor of Mechanics and Structures at the University of Washington.

Professor Miller is northwest representative of the National Advisory Committee on Engineering Seismology.

When a report is completed, it will be made available for use in reconstruction work in the area.

X MARKS THE SPOT where New Jersey's new State Highway Department office building will be erected on Parkway Avenue near Trenton City line at a cost of $1,700,000. Three stories and near 100,000 sq. ft., the structure will house 600 department employees and have its own cafeteria.

Studies begin in earnest on $150 million N. J. road

New Jersey's 130-mile, $150,000,000 toll road, proposed to link Pennsville on the Delaware with Alpine on the Hudson River, is in for some serious study.

The newly created Turnpike Authority recently announced that Charles M. Noble, chief engineer of the state highway department, would be borrowed for six months (ENR May 19, p. 13). Since then two announcements have told the selection of no less than seven consulting engineering firms to be employed in the early investigations. Paul L. Troast, the authority chairman, has expressed the hope that complete engineering, traffic and other studies would be completed within four months and that some grading would be started this year.

The engineering firms named by the authority thus far are: Ammann and Whitney, New York; O. J. Porter & Co., Newark; Frederick R. Harris, Inc., Elizabeth, N. J.; De Leuw, Cather & Co., Chicago; Coverdale and Colpitts, New York; and Howard, Needles, Tammen and Bergendoff, also of New York City. Studies to be carried out will provide information from traffic surveys and analyses, investigation of subsurface conditions, foundation explorations, tentative designs and recommendations of access locations along the routes.

The sale of bonds is planned within six months. Hawkins, Delafield & Wood, of New York, have been signed as bond attorneys to handle marketing of securities with which the turnpike will be financed.

Cost per mile is expected to reach near $3,000,000 in sections of the north Jersey meadows. Plans include the incorporation of a section of Route 100 from Bonhampton through Elizabeth in this northern section. Route 100 was originally to be a federal-aid highway; $3,000,000 in federal funds have already been spent or committed on this section. It will now be necessary for the state to return this federal investment as no federal aid may be used on toll roads.

A decision on toll charges and speed limits will await the outcome of engineering and fiscal studies now under way. According to present plans, no cross traffic and no red lights will hinder through traffic over the entire 130-mile length.

Jay Downer dies, N. Y. parkway engineer

Jay Downer, 71, of Larchmont, N. Y., engineer who for 22 years (until 1934) was in charge of the design, building and maintenance of the famous park and parkway system of Westchester County, N. Y., died at New Rochelle on May 30. In recent years he had been engineer in charge of planning and construction of the New York International Airport, Idlewild, Queens.

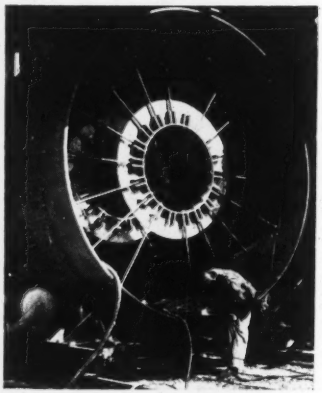
Besides working on the parkways as chief engineer of the former Bronx Parkway Commission and of the Westchester County Park Commission, Mr. Downer supervised the $11,000,000 county beach and amusement park, Playland, at Rye, N. Y., and the $1,200,000 Westchester County Center at White Plains, N. Y.

He was graduated from Princeton University with a civil engineering degree in 1905, and in 1931 received an honorary D. Sc. from Columbia University. As a young man he worked with the U. S. Engineering Corps on improvements of the upper Mississippi River, was employed by the engineering department of the Chicago, Milwaukee & St. Paul Railroad, and was chief engineer of the Cape Breton Railroad, N. S. Later he was resident engineer at Massena, N. Y., of the Aluminum Company of America, engaged in mill construction and power canal projects.

W. Va. road commission drops chief engineer post

Effective this month, the West Virginia State Road Commission has abolished the office of chief engineer. Duties formerly assigned to this office will now fall under the jurisdiction of the commissioner's office an announcement said.

M. L. O'Neale, chief engineer of the commission since 1941, has been appointed consulting engineer to the commission. His duties will consist mainly of serving in an advisory capacity. He will be directly under the jurisdiction of the commissioner but will have no authority over the various engineering divisions.



HUNGRY HORSE PENSTOCK—Four 13½-ft. steel penstock pipes 426 ft. long are being stitched up on the job at the Bureau of Reclamation's Hungry Horse project in Northwestern Montana. They will deliver up to 2,500 cfs. of water to each of four 105,000-hp. turbines. Placing of penstock pipes in the lower portion of the 520-ft.-high dam will start this fall. The General-Shea-Morrison Co., a joint venture combination, is prime contractor.

Arbitration pact end made official by labor

Contractors receive notice that they will take no part in settlement of jurisdictional disputes after July 1

Contractor associations participating in the joint board for settling jurisdictional disputes have received finally official notice from the AFL building trades department terminating the year-old union-contractor plan on July 1. Until then, decisions will continue to be issued by the board, but no new joint boards will be set up.

The contractors' attitude on the situation, expressed by board members and rank-and-file contractors alike, could be summed up in these words:

"The Taft-Hartley Law put the contractors in a favored position in dealing with jurisdictional disputes. We joined with the unions only to help them out. If this is the way they want it, we'll go along with it and exercise our rights under the law."

The industry was not laying out any strategy to counteract the decision taken by the building trades unions in Cleveland May 16 (ENR May 26, p. 33). There was a feeling that the contingencies of Taft-Hartley or any new labor law might cause the unions to alter their plans later.

The building trades department is setting up its own plan for settling jurisdictional disputes without participation of the contractors. Decisions will be made by an impartial umpire in consultation with representatives of the unions involved. It is pointed out that this plan differs from those utilized by the unions before the Taft-Hartley law in that the contending unions sit with the umpire, although they do not have voting power. This is supposed to result in decisions more acceptable to the losing union.

Builder foresees trouble

Possible trouble for contractors who seek to cut costs by assigning work to laborers which the unions feel belongs to a skilled craft was forecast by a spokesman for one of the building trades unions. He said that under the new union plan no difficulty would arise for contractors who follow union decisions and work assignment precedents.

It is questioned at the Associated General Contractors office, however, whether contractors can abide by union jurisdictional decisions, even if they wish to, without running counter to the Taft-Hartley Law and opening themselves up to suits for damages by the losing union.

Under the proposed plan, the contractors will not have the protection against damage suits which they now have under the agreement of all building trades unions that they will abide by joint board decisions, it is pointed out at AGC.

BIG ENGINE FACTORY—Caterpillar Tractor Co.'s new plant at Peoria, Ill., covers 19.3 acres; will produce the company's full line of diesels. The 1,120x757-ft. steel-frame structure is enclosed with brick and cast stone. The roof is cast tile, insulated with fiberglass and covered with paper, tar and gravel. Filter units in penthouses clean, heat and recirculate all air in the building in less than eleven minutes. Fluorescent lights give a uniform 40 foot-candles of illumination at eye level.

New York experts suggest S. F. Bay crossings plan

A three-point program for solution of the San Francisco Bay crossing problem recently was offered by three New York consultants retained by a California State Assembly committee (ENR May 19, p. 14).

The plan involves removal of rail tracks from the lower deck of the existing structure and repaving for four lane truck and bus traffic; cantilevering additional traffic lanes out on each side of the upper deck making a total of eight traffic lanes; and construction of a southern crossing substantially as recommended by the 1946 Army-Navy board except that it be four lanes instead of six.

It is expected that the assembly fact-finding committee will adopt with little change the program offered by the consultants, Ole Singstad, O. H. Ammann, and T. T. McCrosky. This will not be an official construction program but it may affect future state appropriations.

These recommendations are significant in that they recognize the need for relieving congestion on the existing structure. This is one of the primary reasons state authorities recently decided in favor of a parallel bridge. Cost estimates (about $195,000,000) closely approximate those made by the state bay toll crossings division for a six-lane southern crossing.

General Plank returns to Europe as a civilian

Maj. Gen. Ewart G. Plank, one of the top engineer officers of World War II, retired from the Army May 31 and left at once for Europe. He will be director of supply and transportation of the International Refugee Organization with headquarters in Geneva, Switzerland. Although his post-war Army assignment has been in the Transportation Corps, where he has served as commanding general of the New York Port of Embarkation, "Eddie" Plank spent most of his 30-year Army career in the Corps of Engineers

—in Panama, Nicaragua, the Vicksburg District and at Ft. Peck Dam.

During the war he was commanding general of the Advanced Section, Communications Zone, in Europe, the unit which supplied food and ammunition, and built hospitals, bridges, roads and camps. At the war's end General Plank was in the Pacific in command prepared to do the same job in Japan.

N. C. passes $200 million rural road bond issue

North Carolina voters by a two-to-one margin approved in a special election on June 4 a $200 million rural road bond issue (ENR May 19, p. 13), and one for $25,000,000 for school buildings throughout the state. Both programs will be started immediately.

Since 1931 all roads and highways in North Carolina have been handled by the state. Out of 61,000 miles about 38,000 miles are classified as county roads, although state maintained. The balance of the system consists of primary and secondary highways eligible for federal aid. The $200 million issue is to be used exclusively for the construction and betterment of the county roads—none of which is eligible for federal aid.

North Carolina already had several million dollars set aside for rural road work. These earmarked funds will permit the very extensive program of rural road construction and improvement to be started at once without waiting for proceeds from the sale of any of the voted bonds. In fact, Governor W. Kerr Scott, who has been the principal proponent of the large bond issue, is quoted as saying it may not be necessary to sell any of the new road bonds until next year. He also is reported to believe that all of the $200 million may not be spent for from five to six years.

Insofar as practical, construction of the rural roads will be done by contract. The State Highway Department has, however, an extensive amount of equipment specially suited for work of this type. The department also has a large staff and field organization experienced in this class of construction and maintenance. Plans accordingly are to start the new expanded rural road program force account, and to bring together as rapidly as possible projects that might interest contractors.

Some $50,000,000 in school buildings may be built promptly as a result of the June 4 election. The last legislature appropriated from surplus funds $25,000,000 for this purpose. The new bond issue will provide the balance. Each of the 100 counties in the state will receive $250,000 from the $25,000,000 bond issue. In addition, each county will receive a uniform per pupil allotment. In anticipation of state aid to the communities for school building construction, detailed working drawings have been completed for many building projects. It will thus be possible to ask for bids and to award contracts rapidly.

Western engineers open new Chicago headquarters

Two memorable occasions—one old, one new—were jointly celebrated by the Western Society of Engineers recently. The group formally commemorated their 80th Anniversary, and dedicated their new headquarters in Chicago.

Founded in 1869 by twelve engineers headed by Col. Roswell B. Mason, WSE is the fourth oldest engineering society in the United States. It was organized as the Civil Engineers Club of the Northwest and was incorporated under its present name in 1880. Present membership exceeds 2,400.

The new WSE headquarters has been under construction for almost a year. It represents a capital investment of $100,000, and completes the first step toward the organization's goal of creating an engineering and science center where various technical groups may eventually be able to locate their quarters.

The society occupies three modernized floors totaling 9,000 sq. ft. at 84 E. Randolph St. in the Chicago Loop. Facilities include: a 200-seat auditorium, which can be enlarged 50 percent by a folding wall; meeting rooms; offices; lounge; and dining room. The society's 25,000-volume library is currently housed in the adjoining John Crerar Library, whose facilities are also available through a connecting doorway to the WSE lounge.

Truman OK's funds; work starts on TVA steam plant

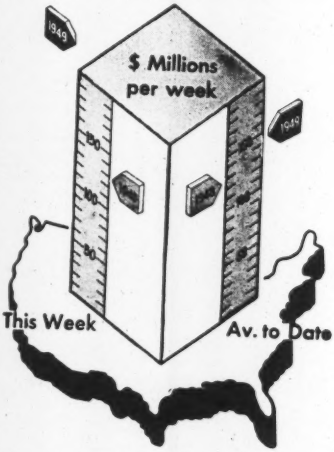
President Truman recently signed into law the deficiency appropriation including funds for Tennessee Valley Authority's steam electric plant at Johnsonville, Tenn. Work is to start immediately on the $54,000,000 generating station.

The 400-acre site on the east shore of Kentucky Reservoir, 66 miles west of Nashville, is to be cleared, and equipment will shortly be moved in for excavation work. TVA expects to have a working force of 1,100 employees on the job when construction reaches its peak sometime about a year from now.

First of the turbo-generators is scheduled for operation in January, 1952, with the other two to follow at two month intervals. The plant was planned and is being designed and constructed by TVA under direction of C. E. Blee, chief engineer; J. S. Bowman, chief planning engineer; and R. A. Monroe, chief design engineer.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	June '49	473.78	227.75
Building Cost	June '49	349.28	188.81
Volume	May '49	275	121



Activity This Week

As reported to ENR (in millions of dollars)

Amount of Contracts let

	Week of June 9 1949	Cumulative 1949 (23 wks.)	Cumulative 1948 (24 wks.)	% chge av.wk.
Federal	$24.5	$468.5	$509.3	−4
State & Mun.	64.5	1,284.8	1,076.9	+24
Total Public	$89.0	$1,753.3	$1,586.1	+15
Total Private	137.2	1,659.8	1,460.1	+19
U. S. Total	$226.2	$3,413.1	$3,046.2	+17

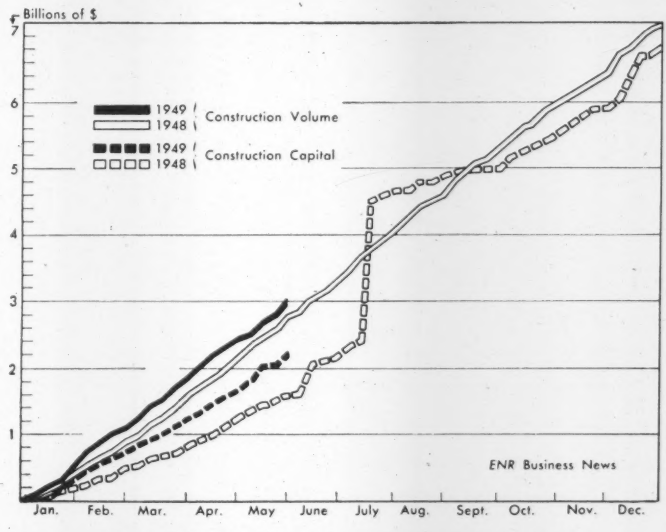
Contracts by type of work

	This Week	Cumulative 1949 (23 wks.)	Cumulative 1948 (24 wks.)	% chge av.wk.
Waterworks	$2.4	$79.6	$95.2	−13
Sewerage	5.5	109.3	94.6	+20
Bridges	5.3	152.7	123.0	+30
Highways	25.1	340.1	440.9	−20
Earthwork, Waterways	13.4	271.1	261.5	+8
Buildings, Public	28.9	685.6	474.8	+51
Industrial	54.2	430.1	471.1	−5
Commercial	66.8	1,050.0	879.7	+25
Unclassified	44.6	294.5	205.5	+49

NOTE: Minimum size projects included are: Waterworks and waterway projects, $25,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (23 wks.)	Cumulative 1948 (24 wks.)	% chge av.wk.
NON-FEDERAL	$2,363.2	$1,706.2	+44
Corporate Securities	1,131.6	930.5	+27
State and Municipal	1,231.6	775.7	+66
Total Capital	$2,363.2	$1,706.2	+44



Record public construction in May spurred by highway building boom

A sudden boom in highway construction boosted May public contract awards to a postwar record, while slackening industrial building left private volume at a near low for the year.

May heavy engineering contract awards of $150 million weekly were the top for this year—public gains more than offsetting private losses. The 1949 total reached $3 billion by month's end, 17 percent above this time last year.

Record public contract awards of $87,000,000 a week were 21 percent above May 1948, and three percent higher than January—the former peacetime high. State and municipal awards, up four percent from April's record and 24 percent above May 1948, averaged $69,000,000 weekly. Highway construction alone accounted for $25,800,000 of this total, 66 percent more than in April, and three percent above May 1948. Federal awards at $17,800,000 weekly top April by 44 percent—May of last year by 10 percent.

Private construction averaged $63,000,000 a week, seven percent below April, and next to January 1949's lowest rate. May industrial building slipped for the fourth consecutive month to a weekly $12,000,000, compared with $30,800,000 in March. This is 35 percent below the May 1948 average.

Commercial building declined slightly to $44,700,000 a week (April commercial awards averaged $46,300,000), but was 9 percent above 1948.

Earthwork and drainage contract awards were $12,500,000 a week, up 44 percent from April, and 47 percent above the May average last year. Bridges averaged $7,000,000, a 41 percent gain over the previous month, and 77 percent above May 1948.

Public building dropped to $26,000,000 a week, a 19 percent decline from the April average, but still 35 percent ahead of last year. Waterworks fell 23 percent to $3,000,000, 63 percent under May 1948; sewerage lost three percent, but doubles last year's May average; and unclassified, down two percent from the April average, is still a thumping 147 percent above May a year ago.

New construction capital of $137 weekly in May was the highest so far this year. It tops the previous 1949 high (February) by 35 percent, and May last year by 69 percent.

State and municipal bond issues led with $76,000,000 weekly, 70 percent above May 1948, and 31 percent over March—former 1949 high. Corporate construction financing was $61,000,000 weekly, a five percent gain over April, and 68 percent above 1948.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—MAY, 1949

Engineering News-Record *reports continental U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation,* $28,000; *other public works* $50,000; *industrial buildings,* $68,000; *other buildings,* $250,000

Four Weeks—Thousands of Dollars (000 Omitted)

	May, 1949						U. S. Cumulative Five Months		Change	
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1949 (21-weeks)	1948 (22-weeks)	'48-'49 Aver. Wk.	Canada May '49
Public Works											
Waterworks	90	75	3,912	2,838	4,707	1,511	**13,133**	**65,100**	92,211	− 27	1,106
Sewerage	4,179	1,688	1,754	964	3,956	11,851	**24,392**	**97,874**	87,082	+ 18	1,030
Bridges	1,328	11,776	6,111	3,735	5,428	1,305	**29,683**	**137,941**	112,324	+ 29	775
Earthwork and waterways	159	9,174	15,261	460	14,631	10,328	**50,013**	**253,141**	245,134	+ 8	109
Streets and roads	2,683	25,035	14,295	16,184	32,099	13,266	**103,472**	**293,161**	385,337	− 21	7,205
Public buildings, residential	10,117	6,150	1,240	.....	2,413	398	**20,318**	**155,533**	32,110	+407	842
Other public buildings	8,866	18,759	9,474	12,357	17,008	18,173	**84,637**	**480,832**	400,291	+ 26	11,690
Unclassified	263	5,825	951	6,699	3,753	4,611	**22,102**	**104,503**	89,008	+ 23	10,823
Total public	**27,685**	**78,482**	**52,998**	**43,237**	**83,905**	**61,443**	**347,750**	**1,588,085**	**1,443,497**	**+ 15**	**33,580**
Federal government (Included in above classifications)	1,580	11,091	15,821	2,248	25,008	15,537	**71,285**	**433,943**	468,916	− 3	888
Private											
Bridges	.....	.....	.....	.....	.....	.....	.....	**1,075**	800	+ 42	.....
Industrial buildings	753	6,718	7,609	15,063	13,211	4,866	**48,220**	**387,870**	400,831	+ 1	11,285
Com'l. buildings, residential	3,486	24,539	18,888	29,877	29,336	38,177	**144,303**	**723,346**	611,679	+ 24	3,270
Other commercial buildings	1,709	5,640	7,503	9,884	8,210	1,633	**34,579**	**230,891**	187,676	+ 29	5,296
Unclassified	1,766	300	5,093	2,639	16,508	551	**26,857**	**132,574**	92,554	+ 50	10,670
Total private	**7,714**	**37,197**	**39,093**	**57,463**	**67,265**	**45,227**	**253,959**	**1,475,756**	**1,293,540**	**+ 19**	**30,521**
Total Engineering Construction:											
May, 1949—4 weeks	**35,399**	**115,679**	**92,091**	**100,700**	**151,170**	**106,670**	**601,709**	.....	.....	.....	**64,101**
April, 1949—4 weeks	30,500	199,570	93,291	59,433	136,047	70,852	**589,693**	.....	.....	.....	69,361
May, 1948—4 weeks	24,126	201,847	69,616	50,089	105,867	83,639	**535,184**	.....	.....	.....	34,012
Five Months—1949	**123,926**	**804,115**	**460,760**	**372,867**	**798,971**	**503,202**	.....	**3,063,841**	.....	.....	**251,181**
Five Months—1948	127,435	803,512	468,479	296,549	654,836	386,226	.....	.....	2,737,037	.....	151,383
% Change '48 to '49	+2	+5	+3	+32	+28	+36	.....	.....	.....	+ 17	+66

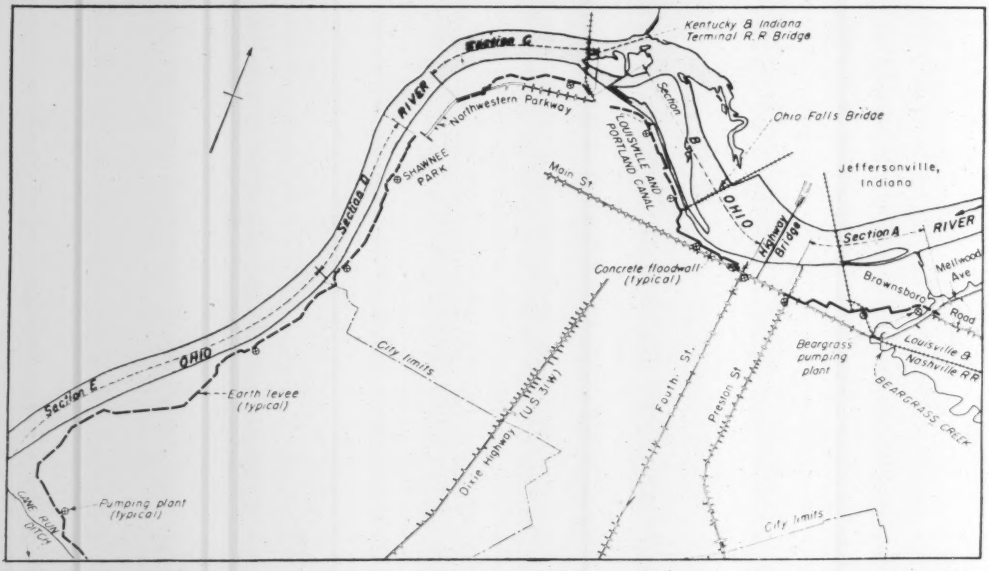
A 17.5-mi. system of levees and flood walls will bar . . . . . .

Heavy Earthmovers remove unstable material, and spread and compact final fill that will . . .

Build Levees protected by heavy riprap at points subjected to eroding river currents. Elsewhere . . .

Reinforced Concrete walls at a downtown railroad yard, will protect business areas. Access is gained through . . .

Gate Closures (There are 50 provided for rail and motor traffic) which can be blocked with light-weight gate sections.



All For Protection of the entire low-lying area of the city of Louisville, Ky., from disastrous effects of floods on the Ohio River.

. . . Louisville's Most Unwelcome Visitor

SCENES LIKE THIS ONE, when the city's business district was inundated in the great flood of 1937, won't happen again when the floodwall is completed. (Wide World Photo.)

AS LONG AS the Ohio River flows peacefully by Louisville, Ky., it is one of the city's most valuable assets. But when the river goes on a rampage as it did in 1937—flooding two-thirds of Metropolitan Louisville—it becomes the city's most unwelcome visitor.

Insurance against a repetition of such a disaster, which caused $52,600,000 worth of damage, is being taken out in the form of $23,500,000 worth of earth levees and concrete floodwalls, exclusive of right-of-way costs.

The flood-protection program is being carried out by contract under the supervision of the Louisville District, Corps of Engineers. Construction completed or under contract to date totals $6,000,000. The entire program is planned for completion in 1953, contingent upon sufficient and continuing appropriations of federal funds.

Statistics alone are no measure of the magnitude of this program, but the size and scope of some of the major items involved indicate that it is one of the largest metropolitan flood protection plans on record. There will be a total of 13.3 mi. of earth levee, involving 3,000,000 cu.yd. of rolled fill, and 4.2 mi. of reinforced concrete wall containing 60,000 cu.yd. of concrete.

Many gate closures needed

Passage through the levee and wall sections during normal times will be through 50 gate closures, the highest of which are 20 ft. In addition, 30 ramps will pass over the wall 3 ft. below its top. During flood, the ramp openings will be sandbagged to the top of the wall, while the gate closures will be made with light-weight sectional gates designed for manual installation.

Probably the most incredible item of all—from the standpoint of magnitude of construction—is the provision for pumping surface water that may collect behind the wall during a major flood. There will be 14 pumping stations costing an estimated $9,200,000. Their combined pumping capacity of 6,300,000 g.p.m. will be 126 times that of Louisville's present water pumping plants for domestic and industrial usage.

One pumping plant alone (Beargrass) will have a capacity of 7,000 cfs. which is two-thirds the capacity of the famed Mill Creek pumping plant in Cincinnati. Beargrass pumping plant will handle runoff from a 54-sq.mi. area. The smallest pumping plant in the system will have a capacity of 78 cfs.

It will cost Louisville $50,000 a year just to maintain the pumping plants in readiness for emergency operation. And an additional $125,000

of city funds will be needed yearly for amortization and interest on the $2,500,000 bond issue approved for right-of-way costs.

Protection 3 ft. above 1937 flood

Although the initial cost of construction and the costs of maintenance are appreciable, completion of the program will afford protection for Louisville from a flood crest 3 ft. higher than that of 1937.

As in other flood protection works of this nature, all costs except those for acquiring right-of-way are furnished by the government, under the Flood Control Act of 1938. In addition to furnishing right-of-way and maintaining the project upon its completion, Louisville guarantees the government against any damage arising from law suits resulting from construction operations. In a separate agreement with the city, Jefferson County is furnishing 8-mi. of right-of-way and will maintain that section of the system outside of the city limits.

Five levee and wall contracts

Levee and wall construction for the entire 17.5-mi. system has been divided into five sections, or contracts. As shown on the accompanying map, Section A extends from high ground near Brownsboro Road and Mellwood Ave. downstream across Beargrass Creek to high ground near Preston and Main Streets.

Section B runs from high ground near Fourth and Main Streets to the approach fill of the Kentucky & Indiana Terminal Railroad bridge. Section C extends downstream, skirting the northwest edge of the city to high ground at Northwestern Parkway and the west end of Main Street.

Section D runs from high ground in Shawnee Park to the city limits. Section E continues on down the river to near the mouth of Cane Run ditch. It follows up this ditch at right angles to the Ohio River, along Big Run ditch, terminating on high ground at U. S. Highway 31W. This section of the flood-protection system is in Jefferson County, outside of the city limits.

Extending Section E such a distance below Louisville has a twofold purpose. It permits expansion of the city in that direction and also protects an important synthetic rubber manufacturing area. Some 8,000 acres of land will be protected by Section E.

The order of construction, based chiefly on the sequence of acquiring right-of-way is: Section C, D, B, A, and E. Contract and estimated construction costs of the five sections, together with the lengths of earth levee and concrete floodwall in each, are shown in an accompanying table.

TABLE OF COSTS AND LENGTHS OF LEVEE AND WALL

Section	Earth Levee (Lin. Ft.)	Concrete Wall (Lin. Ft.)	Construction Cost
A	1,290	9,570	$4,550,000*
B	5,610	9,900	4,260,000
C	8,800	.....	1,060,000
D	7,980	2,690	650,000
E	46,540	.....	2,310,000*
Totals	70,220	22,160	$12,830,000

* Estimated

Construction of Section C was begun in March 1947 and Section D was started the following October. Both are virtually completed. Section B was started in March of last year and has 500 calendar days for completion. Now 63 percent complete (as of April 1), this section is well ahead of schedule. Section A is expected to be placed under contract this spring, and it is anticipated that work on Section E will get under way some time this year.

Construction of the levee part of the protection works follows rather closely standard procedures. In some areas, however, it is necessary to strip large quantities of unsatisfactory material and subexcavate to a depth of 20 ft. to secure a firm foundation for the heavy earth levees. The unstable material is stockpiled and later bulldozed along the land face of the levee. Backfill material, which is carried up to within 5 ft. of the original ground, is clay and silty loam, compacted to 95 to 100 percent density at optimum moisture content.

Good foundation material was extremely difficult to develop in Section C. The contract involved 680,000 cu. yd. of levee embankment. But about 200,000 cu. yd. of unsatisfactory material had to be stripped and subexcavated, and backfilled with compacted material to secure a good foundation for the levee.

Levees are being built to a 1 on 3 slope on both faces, and to a 12-ft. top width. Maximum height of levee is 36 ft. The top and side slopes are seeded, while 18-in. riprap is placed on the river side at locations exposed to appreciable flood currents.

Section B, located in a highly industrialized district, is an expensive section. Embankment material for the levees in this contract is trucked in from a borrow pit located across the old Louisville and Portland Canal.

Major equipment on this contract includes: one 1¼-cu. yd. dragline; three power shovels, ¾-, 1½- and 3-cu. yd.; fifteen 10-cu. yd. dump trucks; four bulldozers; five tractors; two sheepsfoot and one dual-drum roller; four compressors; and five portable light plants.

Sections C and D, involving 770,000 cu. yd. of levee embankment, 5,000 cu. yd. of reinforced concrete in the floodwalls, and 7,000 lin.ft. of 12-in. to 11½-ft. sewers, were constructed by one contracting firm. The large volume of levee embankment called for heavy earthmoving equipment. Satisfactory clay and alluvial silt, located nearby, was loaded into eight 18-cu. yd. bottom-dump trucks by a 32-cu. yd. per min. elevating loader and trucked to the levee site.

Two bulldozers, two patrol graders and five sheepsfoot rollers spread the material in 8-in. layers and compact it to 95 to 100 percent density at optimum moisture content.

Other major equipment on Sections C and D included ten 10-cu. yd. scrapers; six tractors, two 105-cfm. compressors; two power shovels; six portable compressed-air tampers; one trencher for wall excavation; four portable light plants for night operation; and two pavement breakers.

Three types of walls

All concrete walls are cantilever of either the L-type, inverted T or I-type. None has counterforts. Both the L-type and inverted T-walls have cut-off walls at the toe or river edge of footing. The I-type wall is a straight unreinforced concrete wall supported on steel sheetpiling embedded in the concrete.

Wall forms are of unusual interest. As recommended by the Corps of Engineers, they are made in 20-ft. panels containing vertical 12-in. steel beams at 4-ft. centers. Horizontal 8x8-in. timber wales at 2-ft. 6-in. centers are bolted to the vertical beams and faced with two thicknesses of 1-in. tongue-and-groove sheathing running vertical and horizontal. Concrete is placed directly against the inside finished surface of the sheathing.

Only two ties are needed for each

pair of vertical beams—even for the highest walls. The top tie is a pair of 1-in. dia. threaded rods extending across the wall in the form of a yoke. The bottom tie is a single 1-in. rod, threaded at both ends and extending through the wall.

One contractor, who later was awarded a contract for one section of the work, viewed this suggested type of form with considerable skepticism. Alternate bids were permitted, based on forming the concrete with these so-called "rigid" forms and the conventional type forms of timber struts, wales and sheathing. The contractor offered two bids for the concrete, with a premium of $10 per cu. yd. of concrete for using the rigid forms. His lower bid, based on conventional timber formwork, was accepted. After the work got under way, however, the contractor switched to the rigid forms as a time-saving and labor-saving expedient.

One big advantage of the rigid wall forms is that the concrete can be placed and vibrated with greater dispatch, in the absence of the many tie rods or tie wires needed in the conventional timber formwork.

Contractors and engineers

Terry and Steadman, Bay City, Mich., were contractors on Sections C and D. L. H. Terry was in general charge; O. L. Jones, construction superintendent; and L. J. Kik, superintendent on sewer construction. Section B is being constructed by Morrison-Knudsen Co., Boise, Idaho. P. J. Soukup is general superintendent.

Col. B. B. Talley was in charge of the project, as Louisville District Engineer, until succeeded in July 1948 by Col. John L. Person, present district engineer. S. M. Bailey is chief of the engineering division; C. E. Breitbeil, chief, and E. E. Pontrich, assistant chief, respectively, of the construction division; and John H. Krema, resident engineer.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phrases of Construction Contracts (McGraw-Hill)

Failure to Complete Work

There can be no recovery on an entire contract in the absence of full performance. Nor can there be a recovery on a *quantum meruit*, even though the other party has received the benefit of part performance.[1]

In this case the contract was to paint and repair the defendant's house. When the job was half done, the defendant pointed out certain defects and told contractor in vigorous language, to make good the defects or quit. Plaintiff contractor thereupon quit the job and brought the action for breach of contract, but was denied a recovery.

Contractor claimed that as the agreement was in the nature of a building contract, it was not necessary to show full performance. The court pointed out that while courts allowed a recovery on the theory of substantial performance in construction contracts, that even in such a case, the contractor must show that the defects or omissions were not substantial and also the cost of making them good.

Where contract with a subcontractor provided that he would be paid for the work performed by him when the general contractor received payment for said work, subcontractor was not entitled to payment until general contractor had been paid.

Where subcontractor abandoned work and refused to return to the job unless he was paid for the work he had performed, even though general contractor had not been paid therefor, such refusal to complete the job constituted an abandonment of the contract.

In an action brought by subcontractor to recover for the work performed up to the time he abandoned the job, he was denied a recovery. The general contractor was allowed to recover on his counterclaim for the expense necessarily involved in completing the work over and above the sum which he would have paid subcontractor under the contract, had no breach occurred.[2]

(1) Maville v. Donaghue, 193 Misc. 11, 82 N.Y.S. 2d 621 (Municipal Court of City of Syracuse, July 8, 1948.)
(2) Catapano et al. v. Clemente et al., 85 N.Y.S. 2d 764 (Supreme Court, N.Y., June 16, 1948), affirmed 85 N.Y.S. 2d, 274 App. Div. 995.

Cost-Plus Contracts

Where one contracts with a construction company to do work on a cost-plus basis, he has a right to expect the same skill and ability on the work as would be given by the contractor when he must do the work at less than the contract price to make a profit. Where the contractor performs the work in absolute disregard of this obligation; the contractor can only recover fair and reasonable value of the work performed.[1]

A contractor seeking payment for work done on a cost-plus basis must show that the alleged expenditures for materials and work were necessary, otherwise recovery is limited to reasonable cost plus the stipulated percentage.[2]

(1) Title Guarantee & Trust Co. v. Pam, 155 N.Y.S. 333.
(2) Pathe Laboratories v. Du Pont Film Mfg. Co., 3 F.R.D. 11.

Agreement to Subcontract

Where a party agrees in writing, with one who is about to submit a bid for a job, that he will perform certain parts of the work at a specified price, in the event the general contract is awarded to other party, such agreement will be enforced.[1]

In this case the general contract was awarded to the other party, and when he called upon party who had submitted proposal to do part of the work, the latter refused to perform the work. The subcontract was awarded to another party at a price in excess of the price contained in the original proposal.

The general contractor brought the action to recover the excess cost and was allowed a recovery. The other party contended that there was no consideration to support the contract as the general contractor did not even agree to submit a bid. The court held that "A promise which the promisor should reasonably expect to induce action or forbearance of a definite and substantial character on the part of the promisee and which does induce such action or forbearance is binding if injustice can be avoided only by the enforcement of the promise."[2]

Under Louisiana law, a subcontractor who submitted a proposal to do part of the work to be done by a general contractor could not withdraw his bid after the bid of the general contractor has been accepted.[3] In this case the general contractor was allowed a recovery for the difference between the bid by the subcontractor and what the general contractor had to pay another subcontractor to perform the work.

(1) Northwestern Engineering Co. v. Ellerman et al., 10 N.W. 2d 879.
(2) Restatement of Law of Contracts, Section 90.
(3) R. P. Farnsworth & Co., Inc., v. Albert, 79 F. Supp. 27. (U. S. District Court of Louisiana, Aug. 9, 1948.)

Fig. 1. EQUIPMENT TACKLES A SLIDE in Corinth Canal. Upper dragline loads into trucks, while two at low level prepare to load barges. Clamshell dredge is mounted on barge of Navy pontoons. (Photos by Alfred Cook)

Fig. 2. BENCHING OUT A ROAD on the precipitous bank to give trucks access to the slide that blocked the Corinth Canal.

U. S. Builders Greek Ports

John S. Thompson
Albany, New York
(formerly project manager on Greek port work)

WHEN THE GERMANS retreated northward out of Greece in 1944, they demolished the principal ports and blocked the Corinth canal.

Putting those water transport facilities back in order had to wait three years, until U. S. contractors could get on the job.

In the meantime, the Greeks cleared away enough sunken ships to open channels into the ports, and they repaired some quay walls temporarily. But the main task of clearing debris, replacing quay walls, repairing drydocks and opening the Corinth canal remained untouched. In the summer of 1947, the American Mission for Aid to Greece undertook this rehabilitation project.

Contracts for the engineering, management and construction necessary to rebuild the ports of Piraeus, Salonika and Volos, and to clear the Corinth canal were awarded to an American engineering and construction group in August, 1947, and the work was completed in February, 1949—a period of 18 months. Work included rebuilding 9,700 ft. of quay walls, reconstructing two drydocks, extending a breakwater 2,100 ft., dredging and removal of debris and 850,000 cu. yd. of soft rock that was blocking the Corinth canal.

There was little equipment available in Greece. Cranes, shovels, trucks, concrete equipment and floating cranes were imported from the United States. Then all work planning was based on these machines, because time would not permit any major revisions in the equipment schedule.

Corinth canal work

The Corinth canal was blocked at two points by slides blasted out of the steep rock banks. The material was a soft marl with layers of limestone. The Germans also had dropped two bridges into the canal, as well as all the railroad rolling stock in the neighborhood.

The banks of the canal rose almost vertically to a height of 260 ft. at the easterly slide, and 165 ft. at the westerly slide. There was, therefore, an approach to the slides by water from each

Repair Ruined and Canal

end, but the 81-ft. width of the canal limited operation to one floating rig at each place. Dredging the slide material out of the canal was proposed, but there was only one ladder dredge available in Greece. This was put to work on the westerly slide; it removed an average of 1000 cu. yd. per day. A dragline on the toe of the easterly slide loaded an average of 1,300 yd. a day into dump scows.

The dredge and the dragline's scows used all the available space on the water approaches, but their combined output was not enough to meet the required schedule, so additional draglines were used. These were started at the top of the slide, to pull back the side slopes. A road then was cut down the face of the easterly slide, and two 2-yd. shovels benched out the slide down to a point about 50 ft. above water level. When the shovels finished their task, draglines backed their way up the road, removing it as they went.

Later, an old 6-yd. dipper dredge, which had been designed to operate in 20 ft. of water, was reconditioned by increasing the boiler capacity and lengthwise both the dipper stick and the spuds. Although the dredge operated at 26-ft. depths, it proved effective in removing earth and rock as well as the railroad rolling stock.

Port rehabilitation

The quay walls in Piraeus, Salonika and Volos were of a gravity type, of concrete blocks weighing from 30 to 80 tons each. These walls were badly shattered by demolition blasts and they presented a problem in removal. The larger blocks had to be slung by a diver and lifted out individually by a floating crane.

The walls, as rebuilt, followed the original design closely. The blocks lay one on top of another without staggered joints, providing independent vertical columns, which insured a uniform bearing for each block. The foundation was a 3-ft. layer of one-man broken stone. Wherever possible, the old foundations were reused.

The two damaged drydocks were in Piraeus. The smaller one was repaired by placing the gate in its undamaged seat, dewatering, and rebuilding the side wall in the dry. The gate seat on one side of the larger drydock had been blown out, so a new concrete seat was tremied into place, after which the gate was placed and the balance of the repairs completed in the dry.

Fig. 3. BEFORE AND AFTER VIEWS of quay wall at Salonika. Face consists of 30- to 80-ton concrete blocks stacked about 45 ft. high and backfilled with broken stone.

In Salonika, the Greeks already had started a breakwater extension, to protect part of the harbor. This breakwater was completed under the American program. It was built with a core of one-man stone, placed by dump scows. On top of the core, one course of 80-ton concrete block was placed with the top of the blocks just above water. The core then was weighted with armor stones weighing up to 5 tons each.

Armor stone was loaded by 2-yd. shovels into trucks at a quarry 6 miles from the port. At the quay side, the loaded trucks were run in twos or threes onto deck scows made of U. S. Navy pontoon sections (6x10). The scows were towed to the breakwater, where the trucks dumped the stone overboard, directly into place. A concrete crest was then poured on the 80-ton blocks. A 1-yd. paver on a deck scow alongside the breakwater mixed and placed the crest. The paver's skip hung over the edge of the scow; trucks brought from the shore on another deck scow dumped batches into the paver skip, which could be

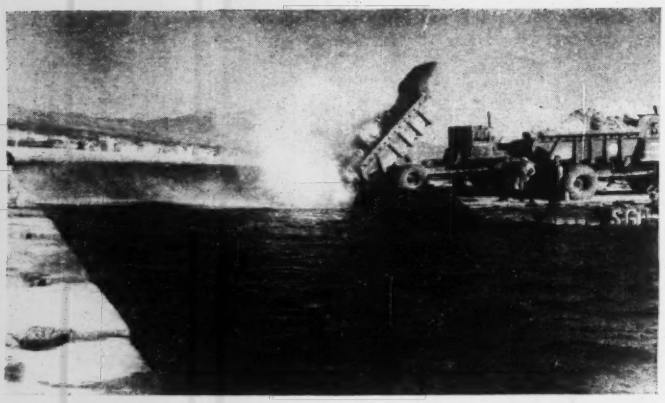


Fig. 4. SEA-GOING TRUCKS dump rock to weight the Salonika breakwater core. The barge is a Navy pontoon assembly.

lowered to land on the scow carrying the batch trucks.

Cost system

An important feature of the work was the cost system, which controlled the whole program in order to make final costs fall within the budget.

Estimates were made as early as possible for each item of work. These estimates were based on the best judgment available as to probable Greek costs but while accurate cost-forecasting was desired, it was not as important as the establishment of a standard from which actual costs could be judged. As the work progressed, a record of actual costs was kept, and after several months the original estimates were revised into line with the actual costs.

At this time, actual cost data indicated that the program could be increased to include certain other quay wall repairs without increasing the equipment or overhead expense, and the program was revised according to this expected outcome. The final cost proved to be just under the original budget.

The work was initiated by the American Mission for Aid to Greece, and supervised by the U. S. Corps of Engineers, Col. David W. Griffiths, district engineer. The contractors were J. Rich Steers, Inc., and Grove Shepherd, Wilson and Kruge, Inc., both of New York, N. Y. The writer was project manager, with William F. Cummings and John C. Xydes as assistant general managers. Harold F. Bower, as assistant general manager, was stationed in New York, in charge of rear echelon.

Soils—Another Stream Polluter

WHAT POSITION do soils and natural contamination occupy in the stream-pollution picture? Are erosion and nature's organic wastes as damaging to stream life as municipal and industrial discharges? What is the cost of treating unnecessarily turbid waters prior to domestic consumption and agricultural loss of washed-away top soil? Is it feasible to process sewage sludge for fertilizer base?

To answer these questions as well as spotlight this under-publicized problem, Harold A. Kemp, director of sanitary engineering for the District of Columbia, worked up a technical and economic appraisal of soils pollution in the Potomac River. He presented his findings on turbidity load, fish-life hazards, increased water-treatment costs and reclamation of fertilizers from sewage sludge to replenish agricultural-soil loss before the Interstate Commission on the Potomac River Basin, April 21-23 at Bedford Springs, Pa. (ENR May 5, p. 11).

Potomac loaded with silt

The mud load of the Potomac River was 1,650,000 tons at Washington last year, according to turbidity tests by the Corps of Engineers, Mr. Kemp said. This calculation does not include the bed load of heavier materials, such as sand and gravel, which probably totals 200,000 tons.

The average annual mud load of the river is estimated to be 1,700,000 tons. This load, he emphasized, does not result from stream-bed erosion. Cross-sectional area of the main streams above Washington has not materially changed in 200 years.

This river load represents an actual loss of 30,000,000 cu.ft. of soil annually above Washington—an equivalent of more than 1,300 acres or two square miles of six-in. topsoil. "The economic loss to agriculture from such erosion is appalling," he declared.

"During the 1936 flood, the turbidity of the Potomac River reached 6,000 ppm., with excessive turbidity lasting 15 days. The fish kill was large and oyster beds were severely damaged. It has been estimated that total mud load during 1936 was nearly 5,000,000 tons." A turbidity of 3,000 ppm., Mr. Kemp pointed out, is considered dangerous to fish life if sustained for a period of ten days.

Fish life also requires a continuous supply of oxygen, Mr. Kemp reminded his listeners. "Unpolluted water at summer temperatures usually contain from 7 to 8 ppm. of dissolved oxygen. The metabolism of fish or disintegration of organic matter can reduce this oxygen content to zero. A fish will surface for air at about 4 ppm., more often at 2 ppm., but will not die. A game fish such as trout might sicken and die in several weeks because it requires a minimum of 5 ppm. oxygen to survive indefinitely."

Fish life snuffed out

"Even a stream with no industrial or domestic pollution carries vegetation and animal life," said Mr. Kemp. Organic matter not only mixes with mud and settles to the river bottom to cover fish life in the spawn-fingerling stage but also consumes oxygen present. The mud prevents reoxygenation and a large part of the young fish will be destroyed.

"Fish that survive face another hazard in turbid waters. Mud or silt in suspension will clog or cut the gills of many fish and mollusks," he warned.

The District of Columbia aims to treat its sewage so that daily average dissolved oxygen in the river will not fall below 3 ppm., Mr. Kemp advised. While this amount is inadequate for hatching, it will permit migration of all types of fish through a stretch of five miles of river in the Washington metropolitan area. Above and below this stretch the river will be suitable for fish life.

Since 1941, this stretch of river has deteriorated to a danger point of less than 2-ppm. oxygen during the summer. Industrial plants and municipali-

ties are correcting pollution conditions but the cooperation of farming interests must be enlisted to preserve all aquatic life in this basin. "It is essential that excessive soils pollution be stopped," he demanded.

Pointing out that he did not wish to "minimize the effect of pollution from industries or municipalities," Mr. Kemp emphasized "that mineral or soils wastes are much more insidious in their destruction of aquatic life than organic wastes." In addition, turbid water makes fish more susceptible to the effects of organic pollution.

Filters cleaned often

Washington, D. C., where summer water consumption, often exceeds 200 mgd., faces a real problem from turbidity in rivers, Mr. Kemp reported. For water treatment, this city utilizes 29 slow sand filters with one acre of surface area each, plus 20 rapid sand filters with a total of one-half acre. These slow sand filters must be cleaned on an average of two times yearly while rapid sand filters are washed every two to four days.

"Adequate soil conservation in the basin can reduce turbidity of the river conservatively by more than 75 percent," he said. "The turbidity for 95 percent of the time can be kept below 100 ppm. It probably can be kept below 25 ppm. for long-sustained periods."

Turbidities in the Potomac River reached 6,000 ppm. during the 1936 flood. More than 1,500,000 tons of soil were transported past Washington during the peak day of the flood; the total for the duration of the flood was 3,500,000 tons.

The extent of the erosion damage can be appreciated by the fact that over 6,000,000 cu.ft. of soil was lost during this single flood. "It would take a freight train 337 miles long to haul a similar load," Mr. Kemp said.

As a gage of turbidity in water he pointed out that at 100 ppm. water is not clear because it contains 400 pounds of soil per million gallons. At this concentration, a one candle-power light disappears at 12-inch depth.

Cost savings for water treatment

If turbidity in the Potomac River is reduced 75 percent, savings in alum, lime and chlorine would total more than $34,000 per year at present costs and consumption. Savings in de-silting of reservoirs would be about $12,000 and cleaning of filters at least $5,000. Exclusive of capital charges, total savings would be over $50,000 a year, Mr. Kemp estimated.

Another advantage of reduced turbidity would be a reduction in costs of dredging. It is estimated that at least 90 percent of the suspended silt is deposited in the wider, deeper, flat portion of the river, below Washington. To maintain a navigable channel, at least 150,000 cu.yd. of silt must be dredged out in the metropolitan area each year. One estimate indicates that a saving of $60,000 per year could be made if turbidities were reduced to 100 ppm.

Sewage-sludge fertilizer

"If the present rate of erosion continues, here and throughout the world, it will be impossible to replenish our losses. . . . We can and must reduce erosion to reasonable limits so that nature and man can keep step with this destructive force," he urged.

As a step in this direction the District of Columbia is now planning facilities to cost over $1,500,000 that will make sewage sludge economically available to the farmer as a humus and fertilizing material, Mr. Kemp reported.

Dewatered on vacuum filters to a moisture content of about 70 percent, sludge from the Blue Plains sewage-treatment plant is stored at Lorton, Va. for disposal. This steadily growing stockpile now amounts to over 200,000 tons. Unfortunately, it is not economical, he said, to use this material beyond the metropolitan area because each ton of solids contains 2.3 tons of water. This means that 3.3 tons must be shipped to get one ton of useful material.

Sludge dried by excess heat

The new plant will utilize excess heat for drying sludge to about five percent moisture content. This reduction in moisture will make delivery within a 250 mile radius economically feasible. Cost will be about $7 per ton f.o.b. the District's plant. It is expected that the material will be marketed as is by a fertilizer wholesaler or fortified by additional chemicals. Mr. Kemp estimated that the sludge contains at present 45.5 percent organic matter or humus, 1.9 percent nitrogen, 0.9 percent phosphoric acid, 0.8 percent potash and 2 percent magnesium. Total ash is 54.5 percent. The 1944 evaluation placed $7.88 per ton on the humus content and $5.34 on the chemicals, making a total of $13.22 a ton.

If funds are made available, dried sewage sludge will be produced at the rate of 75 tons a day within six years, he prophesied.

Experiments indicate that the value of digested sewage sludge such as produced in Washington lies principally in its humus content. Where soils need humus, which is being lost at an accelerated rate, it is anticipated that the sewage-sludge recovery program will constitute a valuable economic contribution to the economic well-being of the District of Columbia region, Mr. Kemp concluded.

Paper Makers Push Study Of Pollution Control

Pushing ahead on its program to ease stream pollution nuisances by paper manufacturers, the National Council for Stream Improvement last year operated seven new-type waste treatment pilot plants, the organization said recently.

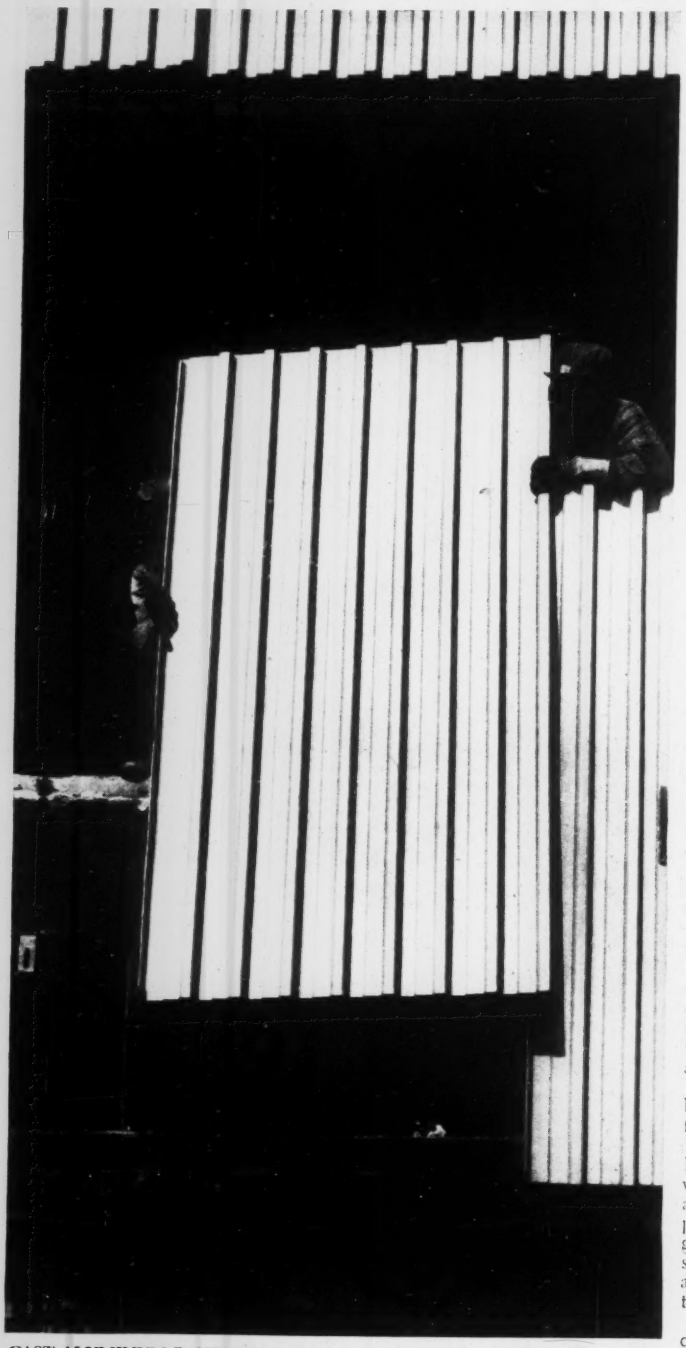
The statement was included in an annual report to members by the board of directors. The council is an organization of the pulp, paper and paperboard industries, with headquarters in New York City.

George E. Dyke, chairman of the board of governors, said that in addition to the operation of the seven pilot plants, direct-mill service was rendered to 75 member companies, located in almost every state of the United States. This service ranged from visits of qualified technical personnel to laboratory work and forwarding of pertinent data to plant engineers who requested it.

Among this other work was considerable laboratory testing of new processes and new chemicals involved in paper making, to determine accurately their effect on waste discharge into streams.

The organization also reported the organization of seven state and local subcommittees to function on local pollution problems.

Research activities of the organization included work on stream analysis at Manhattan College, New York City; a white water project at Rutgers University, New Brunswick, N. J.; research on strawboard waste at Purdue University; an Institute of Paper Chemistry at Oregon State College; kraft mill waste treatment investigations at Louisiana State University; deinking mill waste studies at the University of Michigan and Kalamazoo College; study of semi-chemical wastes at Virginia Polytechnic Institute; studies of waste sulphite liquor at Oregon State College and State College. In addition to this work, a cooperative research program was carried out with the Tennessee Valley Authority, one facet of which was directed at color as a factor in stream pollution control measures.



CAST ALUMINUM PANELS form the outer skin of an office building at the Davenport Works of the Aluminum Company of America. (Alice Cook photos)

Alcoa Builds For Aluminum

WALL CONSTRUCTION used for an office building at the Davenport Works of the Aluminum Company of America may foreshadow future design of commercial buildings. The exterior is of cast aluminum, backed up with 4 in. of precast lightweight concrete—the combination having a fire-resistance rating of 4 hr.

This wall, despite its low weight and 4-in. thickness, appears to satisfy requirements of most municipal building codes for fireproof multistory construction. It can be put in place rapidly and requires little maintenance thereafter, according to the designers. The overall heat-transfer coefficient is 0.30.

Plant covers large area

The rolling mill for aluminum sheet and plate at the Davenport Works is also of considerable interest. In line with current trends toward dry-wall construction, this huge plant sprawling over 52 acres, is inclosed with insulated aluminum wall and roof panels. Located 3½ mi. east of Bettendorf, Iowa, the plant consists of a large group of interconnected operating and service buildings with detached offices, wash houses and cafeteria. Total floor area is 2,250,000 sq. ft.

The main group is one story high. Framing is structural steel, with columns spaced 60, 80 and 100 ft. apart in one direction and 20 ft. in the other.

The 3¼ mi. of walls from floor level to sill height of the low-level sash (4 or 11 ft. high) consist of 9½-in. thick reinforced concrete. Above and between the sash are 295,000 sq. ft. of aluminum cellular panels.

These panels are each 1⅝ in. thick by 24 in. wide and are filled with glass-fiber insulation. The exterior face is 14-ga. fluted aluminum, the interior 16-ga. plain aluminum. Interlocking with ship-lap joints and calked with an aluminum-colored compound, the panels are screwed to ¼-in. hot-dipped, galvanized steel clips connected to the structural steel. They also are retained at top and bottom by aluminum extrusions.

The sash is also of aluminum. It is connected to aluminum extrusions with standard sash clips.

There are 43.7 acres of interlocking

A Rolling Mill Of Aluminum

16-ga. aluminum roof deck, formed in ribs 6 in. wide by 1¼ in. deep. The deck is clipped at 6-in. intervals to all purlins, with every third clip welded to prevent creeping. It is insulated with 1 in. of glass wool and covered with a 30-year bonded slag-and-gravel built-up roofing.

The pitch used on the roof was transported from Chicago in heated tank trucks, arriving on the job at the start of the morning shift heated to the required temperature for application. It was pumped to the roof through flexible hose lines and recirculating pumps.

Four-plies of felt were laid by two-wheel felt-laying machines that were made of bicycle frames especially for this job (ENR Mar. 31, p 56). Operated by one man, the machines applied an entire roll of felt in one operation.

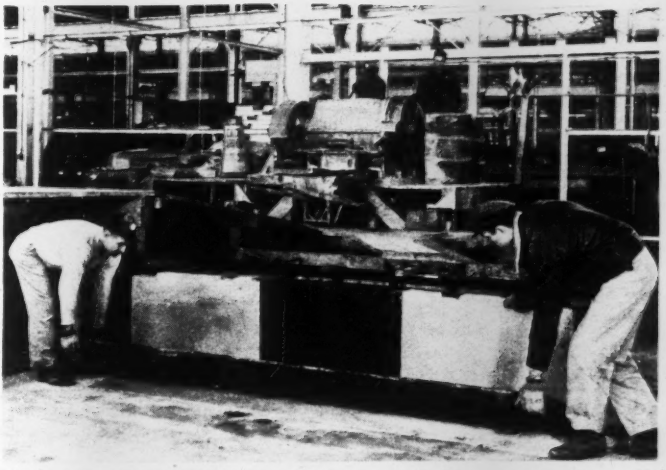
In special cases, other materials were used for walls or roof: The roof deck of the remelt building is of cast-in-place gypsum; of the caustic-dip building, steel deck. Exterior walls of the latter structure are of brick, because caustic reacts with aluminum. Fire walls and interior partitions between service and manufacturing buildings are constructed of 12-in. concrete block.

Subfloors, which consist of 8 or 10 in. of 3,000-psi. concrete, were placed by a 34-E paver in 20-ft. wide lanes. Finished floors are mainly 2½-in. thick, creosoted wood block, but paving brick is used in the remelt building and near furnaces; hardened, steel-troweled concrete in motor rooms in the hot and plate-mill sections, and terrazzo in mill toilets.

Casting economical for facing

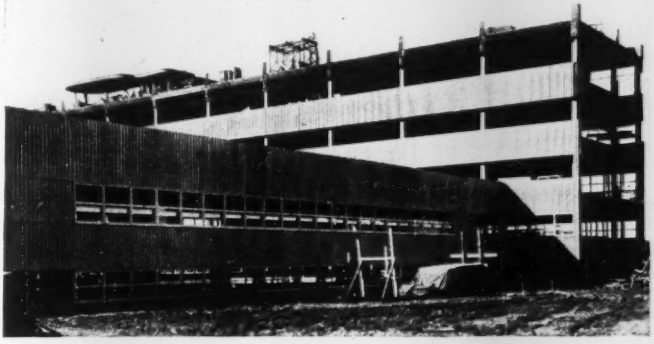
North of the rolling mill is the administration building, which has the cast aluminum walls. Completely air conditioned, this steel-frame structure is 42x220 ft. in plan, 4 stories high plus basement, and has a one-story, 42x120-ft. wing.

Castings were chosen for the exterior skin because of their simplicity, lower cost and ability to meet structural requirements. Designed for a wind load of 60 psf., the spandrels are generally 4 ft. wide and 7 ft. 3¼ in. long, weighing 162 lb. They are stiffened longitudinally by deep corruga-



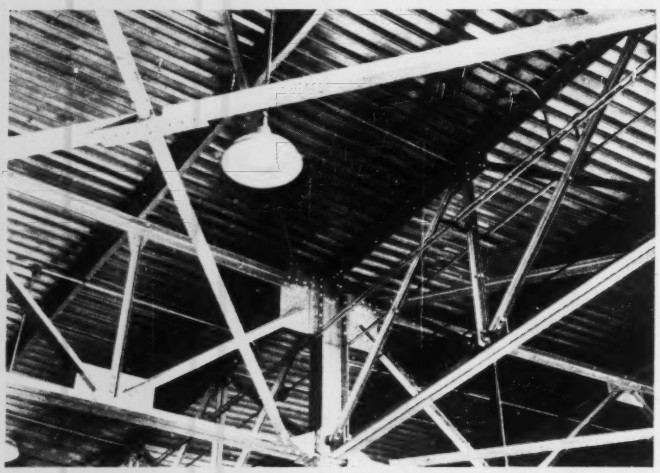
LIGHTWEIGHT CONCRETE, made of cement and diatomaceous earth, was cast in plywood forms to form back-up panels for the office building wall.

CONCRETE SPANDREL PANELS were set 1 in. back from the aluminum facing on a steel plate hung from the spandrel beams.

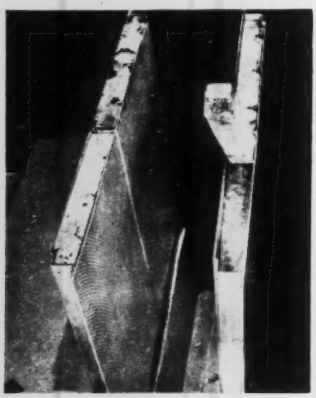


THE OFFICE BUILDING has 12,500 sq. ft. of aluminum and "diacrete" wall, capable of obtaining a 4-hr. fire-resistance rating.

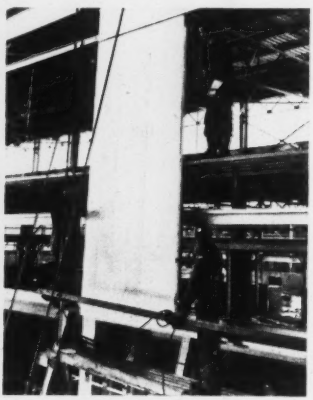
ROLLING MILL at the Davenport Works covers 52 acres. (R. K. Sunderbruch photo)



ALUMINUM ROOF DECK, supported on steel framing, is clipped to purlins spaced 6 ft. 8 in. apart, averaging 3½ sq. ft. of roof per clip.



CELLULAR PANELS of aluminum insulated with glass fiber form . . .



MILL WALLS, held in place top and bottom by aluminum extrusions.

tions and laterally by cross fins on the back. These fins also reinforce the panel against handling and erection stresses and permit connections to be made directly between the panel and the structural frame of the building.

The casting are of 43S aluminum. This material has an ultimate tensile strength of 19,000 psi., yield point in tension of 9,000 psi., elongation in 2 in. of 6 percent, yield strength in compression of 10,000 psi., shear strength of 14,000 psi. and fatigue endurance limit of 6,500 psi.

The 4-in. back-up panels are composed of a 1:6 mix of portland cement and diatomaceous earth, reinforced with 6x6-in. No. 7 wire. They weigh 75 lb. per cu.ft. and have a compressive strength of 760 psi. in 28 days. They were laid with a 1:2:2 mortar of cement, fire clay (18 to 20 mesh) and vermiculite.

These "diacrete" panels were formed in two standard sizes: 37½ in. by 6 ft. 3 in. for the apron wall and 1 ft. 10 in. by 3 ft. 10½ in. for the spandrel. About 960 panels were required. They were cast in ¾-in. plywood forms that had been treated with a plastic waterproofing and coated with paraffin oil before each use, enabling the forms to be used about 70 times each. Steel angles served as wales and studs.

Poured one day, the diacrete panels were generally removed from the forms the next morning. They were cured for a two-week period, during the first week of which they were sprayed regularly.

The walls of the administration building were placed as soon as the concrete floors had hardened. First, the aluminum castings were lowered by hand into position and bolted at the top and bottom of the spandrel beams. Next, the diacrete apron panels were set on the spandrel beams 1 in. back from the castings. Then the diacrete spandrels were positioned on a steel plate hung from the spandrel beam. Finally, an aluminum foil vapor seal was placed over the inside of the panels before plaster was applied.

Harrison & Abramovitz, New York City architects, designed the administration building and George A. Fuller Co. was the general contractor, with P. De Jongh, chief engineer and S. S. Jones in charge.

The architectural and engineering staff of the Aluminum Company of America designed the rolling mill. Walsh Construction Co., of Davenport, Iowa, with C. H. Young as superintendent, placed the underground utilities, foundations and paving and did the grading.

Ten-Year Corrosion-Test Results On Metal Pipe Reported

THERE ARE significant differences in the rate of corrosion of pipe materials subjected to flowing cold water over long periods. Continuous-flow laboratory tests, conducted over a ten-year period by G. A. Ellinger, L. J. Waldron and S. B. Marzolf of the National Bureau of Standards provide this answer to a question long debated by engineers and manufacturers.

Tap water of known analysis was circulated at constant velocity through a system of eight vertical columns, each made up of fourteen specimens of pipe. The specimens (Table) consisted of two types of cast iron, three of wrought iron, two of ingot iron, and three of open-hearth steel. Individual specimens were removed and replaced with new ones of the same materials at the end of specified periods ranging in length up to 10 years. Corrosion of exposed pipe, as indicated by loss of weight and depth of pits, was then evaluated in relation to duration of exposure.

Testing procedures

To prepare specimens, 5½-in. lengths were cut from the pipes, the ends of which were machined smooth and parallel. To remove all surface dirt, grease, and mill scale, test sections were washed thoroughly in strong alkali or soap solution. This was followed by treatment with 10 percent sulfuric acid and an additional washing in clean soap solution. A coating of asphalt varnish prevented corrosion of exterior surfaces during the tests.

Testing equipment was designed to permit continuous uniform exposure of inner surfaces of all specimens to water of known composition and constant velocity. Except for the metal specimens, water within the apparatus came in contact only with rubber, glass, and stainless steel.

Metallic contact and subsequent galvanic action between adjacent specimens were prevented by separating rings of hard rubber. Specimens were fitted securely into recesses machined in the separators.

Care was taken to secure junctions as smooth as possible, since any projection, crevice, or irregularity could interfere with the normal flow of the water and create artificial turbulence and eddies. Turbulence of the water entering the apparatus was prevented by insertion of a number of parallel glass rods in the top of each column.

The columns were supported in a vertical position and maintained in a water-tight condition by the tie rods, guide and supporting sleeves, and stainless steel holders. The capacity of the entire apparatus, including the top and bottom tanks and all columns and overflow pipes, was about 70 gallons.

After removal from the test columns, specimens were dipped in trichlorethylene to dissolve the varnish. Corrosion products were removed by washing and treatment with 10-percent sulfuric acid and dilute caustic soda. Specimens were weighed, and corrosion losses were calculated in grams per unit of interior surface area. Specimens were then sawed longitudinally, and depth of the pits on corroded surfaces were measured.

How corrosion starts

It was found that corrosion of interior pipe surfaces started with formation of small localized mouns of rust, the number and size of which increased with time. Rust that formed during the first year or two was lightly adherent and easily removed. However, as corrosion continued, the rust coating became denser, more tightly adherent, and more difficult to remove as most of the mouns developed into a tubercular form of rust.

Many uncorroded areas were found on surfaces of specimens during the first several years of testing, but few were found on specimens exposed for more than five years. The pH of the water was such that small amounts of calcium carbonate were deposited with the rust, probably increasing the protective effects of rust coating.

Although results show a certain amount of scatter among individual specimens, a rather definite trend was established early in the test and continued through its life. Materials that showed the highest losses of weight or depth of pits in the early stages generally maintained this trend throughout. With respect to loss of weight, test materials fall into three groups. Materials B, E, F, G, H and J (Table) had the lowest corrosion losses; somewhat higher losses were experienced by materials A, D, and C; material I had the highest losses.

Average depths of pits at the end of seven years showed considerably more difference than average losses of weight. Again, materials tested could be divided into three groups. Materials

TABLE—IDENTIFICATION SYMBOL AND COMPOSITION OF MATERIALS.

Identification Symbol	Material	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Graphite
A	Wrought iron—aston process	0.02	0.04	0.092	0.025	0.18	0.03				
B	Wrought iron—hand puddled	0.02	0.06	0.16	0.012	0.12	0.04				
C	Cast iron—centrifugal cast	3.61	0.64	0.34	0.088	2.46	0.37		0.33		2.96
D	Cast iron—sand cast	3.57	0.54	0.57	0.071	2.26	0.15		0.09		2.97
E	Open hearth steel	0.18	0.43	0.010	0.017	0.18	0.05				
F	Copper bearing steel	0.11	0.42	0.007	0.022	0.19	0.29				
G	Ingot iron	0.02	0.03	0.005	0.026	0.01	0.05				
H	Cu-Mo ingot iron	0.03	0.14	0.008	0.012	0.01	0.45			0.07	
I	Cu-Cr-P-Si steel	0.08	0.21	0.16	0.016	0.80	0.39		1.10		
J	Nickel-bearing wrought iron	0.02	0.05	0.087	0.012	0.10	0.08	1.72			

C, J, and H had the shallowest pits; intermediate pit depths occurred in materials A, E, G, and F; and materials D, B, and I had the deepest pits.

Depths of pits

Shallowest pits occurred in the centrifugally cast iron, while sand-cast iron had pits approximately twice as deep. Since loss of weight was about the same for both materials, these results indicate that corrosion of centrifugally cast iron was general, with little localized deep pitting, whereas that of the sand-cast iron was largely by deep pitting. The condition of the casting skin of these materials was probably largely responsible for the difference in corrosion characteristics.

With exception of the two cast irons, which had greater wall thicknesses than the wrought materials, average depths of pits after seven years represented penetrations of from 20 to 40 percent of the wall thickness, whereas after 10 years the penetrations were from 25 to 26 percent. If depths of the deepest pits are used as criteria, penetration of corrosion into various materials other than cast irons ranged between 30 and 70 percent after seven years of testing. In those tested for ten years, penetration ranged from 36 to 52 percent.

Comparison of average depths of pitting obtained in these tests with those obtained in other tests still under way at the National Bureau of Standards on actual service lines indicates that approximately 50-percent greater corrosion occurred in laboratory tests than in service lines. This is probably due to continuous flow of water in laboratory tests as compared with intermittent flow in service lines.

Results of tests indicated no great difference in rates of corrosion of most wrought materials when measured either by loss of weight or depth of pitting. A low-alloy steel had the highest corrosion rate while a copper-molybdenum ingot iron and a nickel-bearing wrought iron had the lowest rates. Other low-alloy materials, such as wrought irons, ingot iron, and ordinary medium carbon steel pipes, corroded at intermediate rates. A rough estimate of the minimum life of these bare materials when subjected to continuous flow of Washington (D. C.) water would be about 15 years on the basis of this work.

Additional data may be found in the paper, "Laboratory corrosion tests of iron and steel pipes," by G. A. Ellinger, L. J. Waldron, and S. B. Marzolf, Paper Trade Journal 127 (No. 10), 27 (1948); and 1948 Preprint No. 21, American Society for Testing Materials.

Wisconsin Cities Experiment With Fluoride in Water Supply

Six Wisconsin cities are already adding fluoride to their municipal water supplies, and three dozen others are planning such programs, in a statewide attack on tooth decay.

According to a series of articles by Herbert Moore, Milwaukee consulting engineer, published recently in "Milwaukee Engineering," the program is aimed at preventing dental caries, by supplying a nutritive important to the chemical structure of tooth enamel.

Mr. Moore reports that at the moment Wisconsin is the leading state in fluoridation of public water supplies. The consulting engineer gives the dental profession credit for awakening interest in public health benefits that may be anticipated. However, he contends that the problem of treating water supplies properly is a matter for consideration by the engineering profession.

"In the 1947 report of the Committee on Water Supply of the Engineering Section of the American Public Health Association," Mr. Moore says, "it was pointed out that the number of people with dental caries is increasing at a more rapid rate than is the use of dental services. The report shows that expenses would be about $12 per capita per year where dental service is utilized by all age groups. Assuming that fluoridation of water supplies will accomplish the same result observed with natural fluoride containing water, the cost of dental care would be reduced about $8 per capita per year."

Chemical costs little

Because of the low cost of the chemical and the necessity for accurate control, its introduction into the public water supply would appear to be a perfectly feasible way to provide just the right daily dose for expectant mothers and for children—the group that would be benefitted most directly.

The dental and medical professions already have given the go sign to the fluoridation program. Planning for the specific steps necessary to introduce fluoride into water supply is an engineering problem.

Discussing this engineering problem, the Milwaukee consultant noted that any community planning to add fluoride to its water must solve the engineering problem of adding a minute quantity of this chemical element in a safe and satisfactory manner.

A relatively simple chemical colorimetric test is suggested to determine the fluoride content of water. In a general way it can be stated that fluorine presence is associated with hard water from a deep well source. The accepted tolerance of fluoride in a water supply is 1.5 ppm., quantities above that figure cause dental fluorosis, or mottled enamel in some individuals. Quantities below 0.5 ppm. are not considered beneficial. The present recommended dosage of fluoride to a supply deficient in the element is 1.2 ppm.

Where fluorspar is mined

Fluorine, of course, is a member of the chlorine family of chemical elements. In its natural state it occurs as calcium fluoride. This is known as fluorspar, or fluorite, mined in southern Illinois, western Kentucky, and Arizona. Over half of the fluorspar used in the United States comes from Illinois and finds its principal use as a flux in iron smelting, in the aluminum industry, and as a source of hydrofluoric acid for etching glass.

"Each city," Mr. Moore said, "presents a different problem based on its existing water supply sources and plant, as well as upon total daily pumpage."

Sheboygan, with a population of 42,000, started adding sodium fluoride on Feb. 25, 1946, and was the first city in the United States to assume responsibility for its own program.

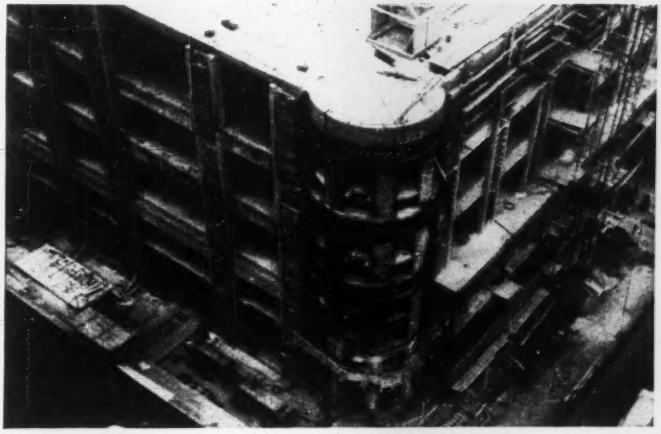
Sheboygan operates a purification plant for treating Lake Michigan water. Existing chemical feed facilities at this plant include gravimetric dry feed machines for the introduction of alum and activated carbon. It was natural, therefore, to select another gravimetric dry feed machine to meet the specific requirements of adding sodium fluoride.

Easily handled

The quantity of sodium fluoride used at Sheboygan amounts to about two tons per month. On the chemical storage floor a chain hoist is provided for the handling of the 375 pound containers.

Cost of the chemical is about ten cents per capita per year.

Other cities now employing the technique include: Elkhorn, Janesville, Mukwanago, Madison and Beloit.



KANSAS CITY LANDMARK strengthened and dressed up to become a bank.

Air-Placed Concrete for Renovation

Tracy Wood
Architectural Engineer, Kansas City, Mo.

BUILDING up the frame and sticking a modern facing on an old Kansas City landmark was an ideal assignment for pneumatically-placed concrete. Masonry columns were preserved, given new dimensions and strengthened, and the new facing was backed up at a cost comparable to that of brick, with the advantage of a firm bond between face and back-up.

Formerly known as the Kieth and Perry Building, this reinforced and dressed-up structure will be the home of the Union National Bank.

For dress-up, the lower two stories were faced with 2-in. slabs of greenstone, a hard material weighing 196 lb. per cu. ft. Upper-story facing is of precast concrete slabs.

All exterior piers and two of the original walls were left in place, to be strengthened and modified dimensionally to the bank's requirements.

Concreting began at the old foundation, where cracks and surface irregularities were eliminated.

Then exterior columns, of granite and brick, were built up. The thickness of concrete shot on the old members was as great as 12 in. in some places. The reinforcement of this concrete was designed for whatever job the additional material had to do. In some cases the additional concrete took the reactions of spandrel beams, and it was reinforced for more axial load. In other cases reinforcement merely increased the radius of gyration.

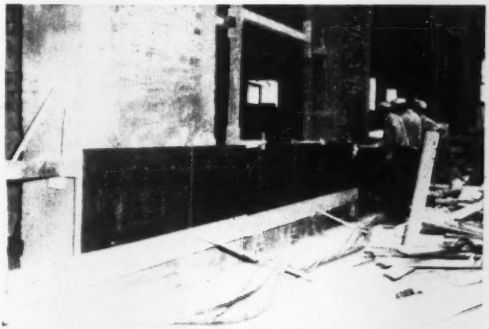
Before it was decided to use air placement for face-masonry back-up, a test of the concrete-stone bond was made as follows: Concrete was blown horizontally into a foot-square form set against a vertical slab of greenstone, also a foot square; the concrete was offset top and bottom, from the stone, and concrete thickness was built up to 4 in. After 28 days, the sample was tested for shear in the bonding plane, a failure load of 32,090 lb. on 132 sq. in. showing a shear strength of 244 lb. per sq. in.

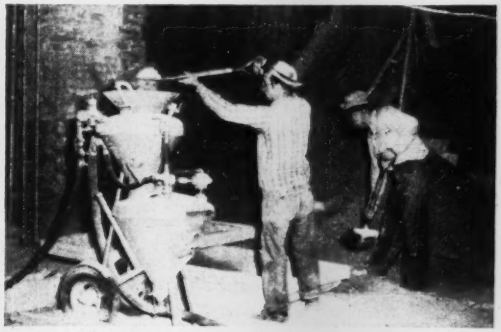
The entire masonry facing was backed up to a thickness of 4 in. with air-placed concrete. Reinforcement consisted of ½-in. bars spaced 12 in. both ways. Some of this back-up was carried onto reinforced concrete or structural steel spandrels. Shelf angles and some bonding stones were used in the construction, but if the bond between facing and concrete had been depended upon entirely, sufficient strength would have been obtained.

The flexibility made possible by the use of air-placed concrete was helpful to the contractor. For instance, ledges were built out from the back-up for setting sills and copings.

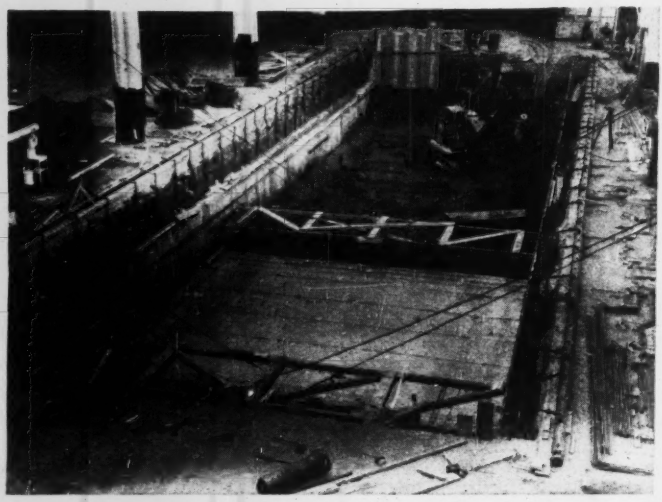
The cost of air-placed concrete back-up is mostly dependent upon the organization of the stone-setting crew. If a stone-setter can set enough stone in a day to give a sufficient number of square feet to keep the placement crew busy for the following day, it is believed that the cost of this type of back-up is no more expensive than the usual masonry or poured concrete.

The writer was architect on the job; Edward Buehler Delk was architect-associate; and Patti Construction Co was the contractor.





STONE-SETTING CREW places greenstone, ready for back-up. Concrete was blown down between stone and pier. Right-hand picture shows the pneumatic concrete placing equipment. Three hoses serve the nozzle for concrete placement: They include an auxiliary high-pressure air hose as well as conventional water hose and sand-cement-air hose.



WET DIGGING—Excavation for heavy-machinery foundation proceeds with help of wellpoints. Cables from columns support trusses for sheetpile bracing.

Floating Foundation Built Indoors

Henry G. Throop

Civil Engineer, Carrier Corporation, Syracuse, N. Y.

A FIRM FOOTING for 675 vibrating tons of machinery—that's what Carrier Corporation wanted when it decided to put thirteen new metal-stamping presses in a building at its Syracuse, N. Y., plant. The answer was an independent floating-box foundation 38x140 ft. in plan and 12 ft. deep, its top flush with the existing ground-supported floor.

The width of the foundation was limited to 48 ft. by the room available between column footings. It was further restricted by the necessity of not undermining existing foundations, although new excavation went down almost 6 ft. below them. These considerations left a width of 36 ft. 4 in. by 140 ft. 4 in. for the new concrete foundation at bottom of the pit. Other requirements called for an arrangement of the foundation that would provide a 10-ft. pit under the new machinery.

The heaviest press, weighing 135 tons and occupying a 12x16-ft. space at floor level, was the controlling design factor, because the structure was to be arranged so that this press could be placed anywhere along either side. After consideration of several foundation types, it was decided to use a concrete pit with 20-in. floor and side walls that would act practically as a concrete floating scow or box. This latter characteristic was due to the condition of the soil underlying the building.

Subgrade tests

Tests determined soil conditions. First, several 6-in. borings were made to a depth of 21 ft. The results are shown by the accompanying drawing (the water level later rose to −6 ft.).

At the point where the 135-ton machine would be installed initially, a square hole was cut to −11 ft. In this was placed a 12x12 timber column with a platform on top. This platform was progressively loaded with 500-lb. increments up to 6,000 lb. From one- to four-day periods elapsed between loadings. The total 6,000 lb. showed settlement of $\frac{3}{16}$ths of an inch.

This load remained in place 18 days, when the total settlement was $\frac{1}{8}$ in. Then a 75 lb. paving breaker was applied to the top of the timber column for 15 minutes. No settlement occurred. After 4,400 lb. were removed, another 15 minute treatment with the breaker was applied. This produced a settlement of $1\frac{7}{16}$ in., or a total of 2 in. This 1,600 lb. load was left on for a month, with no further settlement. On the basis of these tests, available data on the soil conditions and some judgment derived from earlier foundation experience at the site, these conclusions were drawn: The area would carry 1,600 lb. per sq.ft., provided that (1) a properly designed reinforced concrete spread footing was employed to distribute the dead and live loads evenly over the area; (2) there was no unusual disturbance of the soil outside of or below the lines of the new structure during construction; (3) conditions other than those predicted by tests were not encountered during construction; (4) no plastic flow of soil occurred into the pit; (5) a wellpoint system was used to dewater the excavation during the construction period.

The ground at the −12-ft. level originally supported soil and floor weighing 1,460 lb. per sq.ft., and the new, imposed load in place of the excavated material was to weigh 1,370 lb., so proper bearing values for the new structure were present.

Excavation

Fifty-three 18-ft. well points were jetted down on the two sides of the pit close to the location of the side-wall back forms. First 6 ft. of soil was excavated by power shovel in the dry. Then 10-ft. wood sheeting was started around the area; this sheeting later to serve as the back form for the pit walls up to 7 ft. above the excavated grade. The 15-ton power shovel started at one end of the 12 ft. level and excavated the final layers of soil. The wellpoint system was started at this stage and did not stop for 36 days. For the first two days before the water table was lowered to the 12 ft. level, the soil under the shovel pads was plastic, causing the pads to work down several inches into the mud; a rise was noted in the grades back of the shovel where excavation was complete.

When after four days the water table was lowered to the ends of the wellpoint (made evident by a substantial decrease in pump discharge), the 12-ft. grade became solid, and footprints scarcely showed.

When the area of the pit was half excavated, the grade was covered with a layer of fiber-reinforced building paper to prevent boils, and on this the 3-in. gravel mat was placed and graded (see drawing). On this surface, installation of reinforcing rods started.

The sheetpiling was held in place by an arrangement whereby a 6-in. channel-wale was placed 3 ft. above

the lower grade, and held in place by ¾ in. rods passing up at an angle of 45 deg. through to the top of the floor, where they were anchored. Further internal bracing was provided by flat trusses made from 6x6's and planks (see first illustration). These were located on transverse column lines, and they were partly suspended by diagonal cables from the columns.

Concrete box design

To secure an equal and even distribution of load on the soil and concrete foundation, it was assumed that the 135-ton press (the controlling factor) would distribute its load over 16 ft. of the pit's length and half the pit's width. To obtain this distribution it was necessary that the following conditions obtain:

1. The pit floor would act as a beam with side walls and piers as abutments;
2. Pit walls would act as cantilevers against water and earth pressure;
3. Pit walls and floor would take stress along the axis of the pit, due to unequal loading;
4. Pit walls would act as beams uniformly loaded for 16 ft. in any portion, to transfer loads to the foundation;
5. A continuous beam 5 ft. wide, 20 in. deep, and 140 ft. long, on the floor axis, would support 17 center piers and transfer their loading to the footing floor.

Based on the above, the design called for 67 tons of reinforcing steel, mostly ¾ and 1-in. rounds. Floor steel was placed on precast concrete strips over the gravel, and top steel rode on precast 4x4-in. concrete chairs.

Concrete

The pit floor was cast in two sections, on consecutive days. The end walls and half the length of each adjacent side were cast at one run. The total yardage was 573 in four pours. An integral waterproofing, 2 lb. to the sack of cement, was used, and the entire pit interior painted with waterproofing paint.

Several pin hole leaks developed at construction joints. These were stopped by the use of a waterproofing compound. No expansion joints were installed in the structure, since it was considered that there would be little variation in temperature throughout the year. Inserts were provided for the attachment of bus ducts and piping.

A structural steel support for floors and machines was installed on the walls and piers, consisting of 14-in. 53-lb. WF beams used as runners on the sidewall ledges and on top of the piers. These beams were to provide not only a support for the floor and machine beams, but also to form a skidway for moving the heavy machines in case a new arrangement was desired.

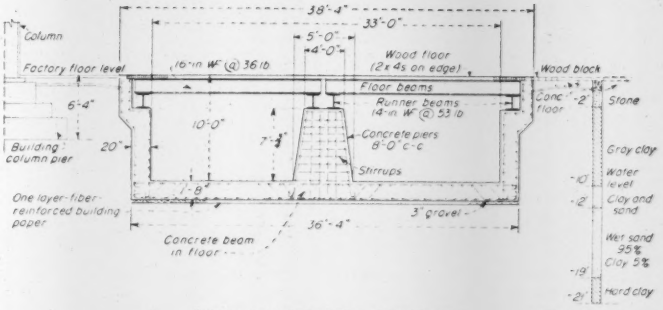
Across these runner beams the floor-beams, 16 in. 36-lb. WF, were placed 5 ft. apart between the machine foundations. Each machine was supported on larger size beams at closer spacing.

Floor construction

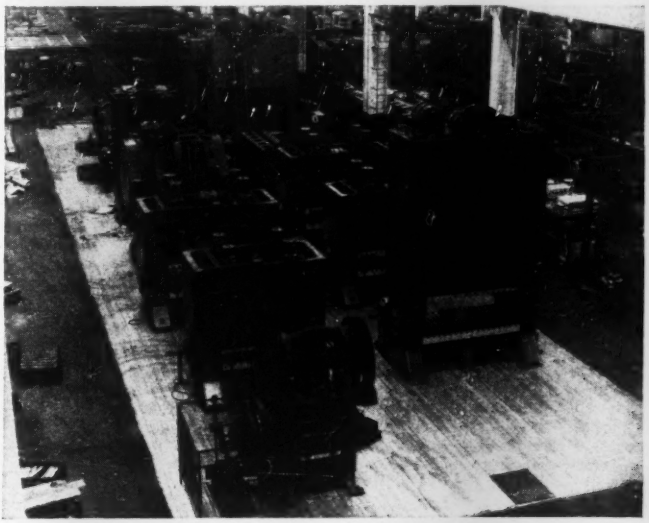
The working floor that was placed on the floor beams consisted of a laminated wood surface formed from 2x4 lumber nailed together on edge, in panels, and clipped to the steel floor beam with ¾-in. bolts.

The thirteen machines for which the foundation was designed and built have been in service for five months. To date no apparent cracking or settlement in the foundation is evident. The water level back of the side walls is 5 ft. below the factory floor.

The new press shop facilities were developed under the direction of J. L. McLaughlin, manager of factory engineering for Carrier. Basic foundation design and construction problems were worked out by the writer and W. J. Gamble, assistant to Mr. McLaughlin. Foundation construction was carried out under the supervision of G. H. Anglin, plant engineer, Carrier Corporation. The general contractors were Dawson Bros., Inc., of Syracuse.



BUILT LIKE A CONCRETE SCOW, this heavy machinery foundation is independent of the main factory substructure.



METAL-STAMPING PRESSES, largest weighing 135 tons, in place on their new floor.

Economical Flexible Pavement Design

Norman W. McLeod
Engineering Consultant, Department of Transport, Ottawa, Canada

Part IV Thickness Design Curves

In the preceding section of this series of four articles (ENR May 26, p. 49), an equation for determining the thickness of flexible pavements was presented. (Equation 1, Part III). For convenience it is repeated here.

$$T = K \log (P/S) \qquad (1)$$

In this equation, T is the thickness of granular base in inches, P the gross wheel load in pounds, S the total subgrade support in pounds, and K the base-course constant.

Design curves for runways

Fig. 34 consists of a chart of curves for thicknesses of granular base required for runways for a wide range of aeroplane wheel loads for capacity operations. The curves are based upon the flexible-pavement-design equation given above, upon a deflection of 0.5 in. for 10 repetitions of load, and upon a value of the base course constant K that varies with size of contact area as indicated in Fig. 33 (Part III).

The flexible-pavement-thickness requirements of the U. S. Corps of Engineers' for subgrades with soaked CBR ratings of 3 and 4.5, are shown on the curves of Fig. 34 by means of circles and crosses, respectively. The cross-hatched portion of Fig. 34 gives the range of thicknesses indicated by design equation (1) based upon actual load test data (0.5-in. deflection for 10 repetitions) for eight Canadian airports at which the average soaked CBR ratings of the subgrade vary from 2.2 to 4.6.

Quantitatively speaking, the combined load test and traffic information obtained during this investigation, and represented by the cross-hatched portion of Fig. 34, demonstrates that runways with overall thicknesses of base course and surface varying from one-third to four-fifths (depending upon climate, depth to water table, etc.) of those required by U. S. Corps of Engineers' design, have been functioning satisfactorily in Canada, under reasonably heavy traffic.

This wide difference in thickness requirements appears to be due partly to the difference between CBR and plate bearing tests as a basis for design, and partly to the fact that the Department of Transport's investigation has demonstrated that the moisture contents of the top inch of the soaked subgrade samples upon which the CBR test that forms the basis for the Corps of Engineers' design is made are from 25 to 140 percent higher than the actual moisture contents of the subgrades under the pavements of the Canadian airports investigated so far.

While the thickness requirements for flexible pavements for runways determined by the Department of Transport's investigation and summarized in Fig. 34 are considerably less than those recommended by the U. S. Corps of Engineers, there is some evidence that the requirements of Fig. 34 are still too conservative, and that lesser thicknesses than even these may eventually be found to be satisfactory for runways.[10]

Design curves for taxiways and turnarounds

Experience has demonstrated that a greater thickness of flexible pavement is required for taxiways, aprons, and turnaround areas at the ends of runways than for the runways themselves. It is believed that Figs. 20 and 21 (Part III) provide a rational basis for determining this greater thickness. The wheels of a standing aircraft will settle steadily into the pavement if the yield point of the overall structure is exceeded. Consequently, if the design for flexible pavements for runways for capacity operations is to be based upon subgrade support at **0.5-in. deflection** for 10 repetitions of load, it seems reasonable to base the thickness design for taxiways, aprons and turnarounds for capacity operations, on the supporting value of the subgrade at **0-35-in. deflection** for 10 repetitions of load, since the average yield point for the flexible pavements for the airports tested thus far occurred at 0.35-in. deflection, Fig. 21 (Part III).

Fig. 35 contains the thickness design curves for capacity operations for a number of wheel loadings for taxiways, aprons and turnarounds, and also for runways. Since there is a constant ratio between the subgrade support at 0.5-in. and that at 0.35 in. deflection for each individual size of

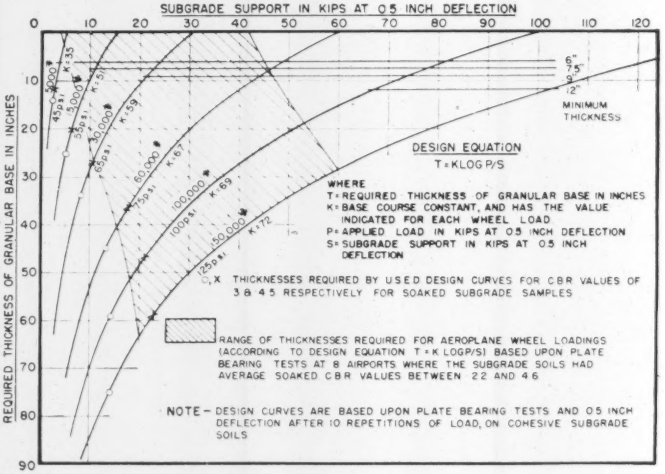

SUBGRADE SUPPORT IN KIPS AT 0.5 INCH DEFLECTION
0
10
20
30
40
50
60
70
80
90
100
110
120
REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
10
20
30
40
50
60
70
80
90
6"
7.5"
9"
12"
MINIMUM THICKNESS
DESIGN EQUATION
T = K LOG P/S
WHERE
T = REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
K = BASE COURSE CONSTANT, AND HAS THE VALUE INDICATED FOR EACH WHEEL LOAD
P = APPLIED LOAD IN KIPS AT 0.5 INCH DEFLECTION
S = SUBGRADE SUPPORT IN KIPS AT 0.5 INCH DEFLECTION
45,000 lbs K=1.35
30,000 lbs K=1.51
20,000 lbs K=1.59
65,000 lbs K=1.57
60,000 K=1.67
75,000 lbs K=1.67
100,000 K=1.69
100,000 K=1.69
150,000 K=1.72
125,000 lbs K=1.72
O, X THICKNESSES REQUIRED BY USED DESIGN CURVES FOR CBR VALUES OF 3 & 4.5 RESPECTIVELY FOR SOAKED SUBGRADE SAMPLES
RANGE OF THICKNESSES REQUIRED FOR AEROPLANE WHEEL LOADINGS (ACCORDING TO DESIGN EQUATION T = K LOG P/S) BASED UPON PLATE BEARING TESTS AT 8 AIRPORTS WHERE THE SUBGRADE SOILS HAD AVERAGE SOAKED CBR VALUES BETWEEN 2.2 AND 4.6
NOTE – DESIGN CURVES ARE BASED UPON PLATE BEARING TESTS AND 0.5 INCH DEFLECTION AFTER 10 REPETITIONS OF LOAD, ON COHESIVE SUBGRADE SOILS

FIG. 34. COMPARISON of design requirements of the manual of the Corps of Engineers with designs based on study of Canadian airport pavements.

bearing plate (See Fig. 14, Part II) both sets of curves can be plotted in terms of subgrade support at 0.5-in. deflection on the same diagram.

In Fig. 36, the thickness design curves for capacity operations for a number of wheel loadings for runways, and for taxiways, aprons and turnarounds, are given in terms of cone-bearing, Housel-penetrometer, field-CBR, and triaxial-compression ratings of the subgrade, and also the subgrade supporting value at 0.2 in. deflection on a 30-in. diameter plate at 10 repetitions of load. Fig. 36 is based upon Fig. 35 and upon the relationships which were established between these four tests and the plate bearing test, Figs. 23, 24, 25 and 26 (Part III).

Figs. 18 and 19 (Part II) demonstrate that unit subgrade and pavement support is more than twice as high for a 12-in. as for a 30-in. bearing plate. Fig. 33 indicates that the supporting value of base course material per unit thickness is approximately twice as large for a 12-in. as for a 30-in. bearing plate. These two considerations emphasize the economies that are possible in flexible pavement design for airport landing areas for aircraft equipped with widely-spaced multiple-tired landing wheel assemblies, as compared with the use of a large single tire. To a lesser degree this is also true of flexible pavement design for highway wheel loads.

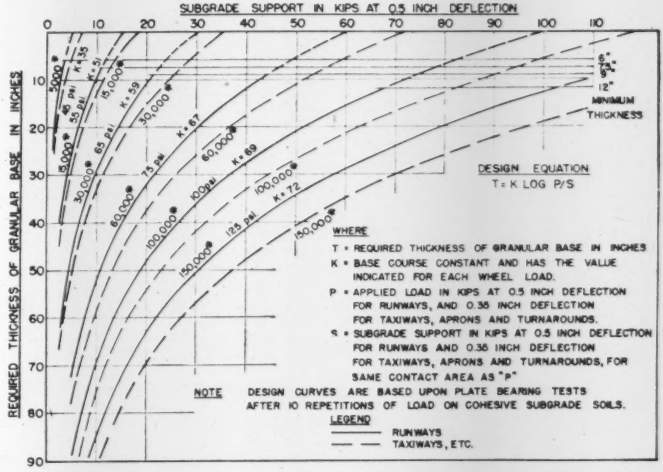


FIG. 35. DESIGN CURVES for flexible pavements for runways, taxiways and turnarounds for various wheel loadings.

Flexible pavement for highways

To avoid settlement into the road surface when vehicles are parked or stalled, flexible pavements for highways should probably be designed on the basis of the yield point deflection, which was indicated to be 0.35 in. for 10 repetitions of load for flexible pavements studied so far (see Fig. 21, Part II)

The curves of thickness requirements for highway wheel loadings illustrated in Fig. 37 are based upon the flexible pavement design equation (Equation 1) for a deflection of 0.35 in. for 10 repetitions of load, and upon a value of K which varies with size of contact area, as indicated by Fig. 33.

The small circles and crosses on the four curves represent the thickness of granular base required by the U. S. Corps of Engineers' design for flexible pavements on subgrades with soaked CBR ratings of 3 and 4.5 respectively, and are based upon a survey of flexible pavement performance on highways in California for subgrades which had CBR ratings of 3 and 4.5 respectively, at some time during the year, if not permanently.

The distance between the circle and the cross on each curve of Fig. 37 represents the range of thicknesses of flexible pavement required by the Corps of Engineers (and presumably by the California Division of Highways[11]), for subgrades with soaked CBR ratings of 3 to 4.5. Actual plate bearing tests at eight Canadian airports with subgrades having soaked CBR values between 2.2 and 4.6, have warranted the very much wider range of thicknesses shown by the shaded portion of Fig. 37, because the actual moisture contents of these subgrades are considerably less than those of the thoroughly soaked samples upon which the standard CBR test is made.

Fig. 38 provides a chart of thickness design curves for four highway wheel loadings in terms of the cone-bearing, Housel-penetrometer, field-CBR and triaxial-compression ratings of the subgrade, and the subgrade support on a 12-in. plate at 0.2-in. deflections for 10 repetitions.

From the flexible pavement design equation, $T = K \log (P/S)$ given in Part III as Equation 1, the angle of spread for the transmission of pressure through different thicknesses of granular base course can be calculated, on the basis of a uniform subgrade support across the base of each cone of pressure. This is illustrated in Fig. 39 for the design equation $T = 35 \log (P/S)$ applied to a 12-in. diameter plate on which the unit load is 80 psi. This approximates a highway wheel load of 9,000 lb. The table in Fig. 39 indicates that the angle of spread increases with thickness of base course for this design equation. In general, the angle of spread is indicated, to be a great deal less than 45 deg., the value upon which several formulae for determining the required thicknesses of flexible pavements are based.

For a base course thickness of very nearly 13 in., the table of Fig. 39 indicates that the angle of spread given by Equation 1 has a value of 24 deg. 54 min. which according to Bail[12] is employed by the New Mexico State Highway Department for establishing the required thickness of flexible pavement.

When the base course thickness is very nearly 16 in., the table in Fig. 39 shows that the use of the design equation $T = 35 \log (P/S)$ provides an angle of spread of 26.5 deg. Bail reports that this angle is utilized by the Texas State Highway Department to determine the necessary thickness of flexible pavement. Consequently, the flexible pavement design equation (1) and the resulting curves of thickness requirements contained in Figs. 37 and 38 appear to be in good agreement with the actual design procedures of the two state highway departments with which they can be checked.

When employing the equation $T = K \log (P/S)$ to design for a high density traffic, it should be based upon 0.35-in. deflection for 10 repetitions of load. When the anticipated traffic density is low, the design criterion should be 0.35-in. deflection for one repetition of load. For an exceptionally high intensity of traffic, design might be based upon 0.35-in. deflection for 100 repetitions of load, and

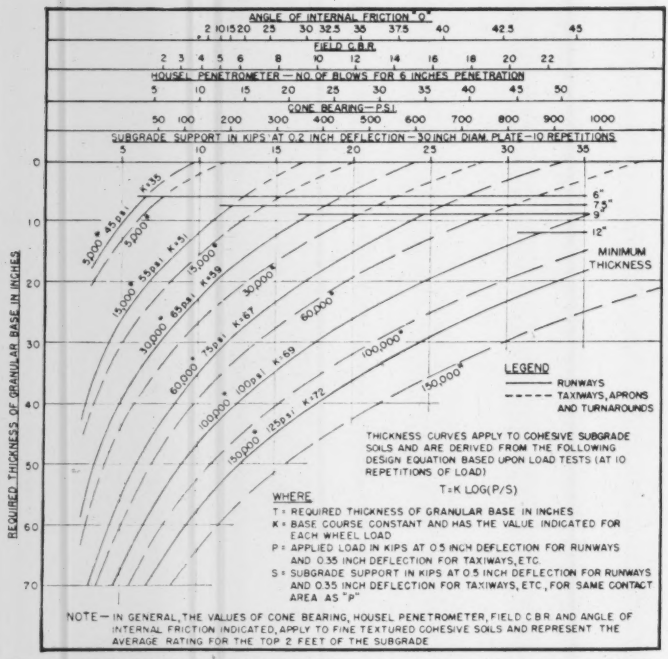

ANGLE OF INTERNAL FRICTION "Ø"
FIELD C.B.R.
HOUSEL PENETROMETER — NO. OF BLOWS FOR 6 INCHES PENETRATION
CONE BEARING — P.S.I.
SUBGRADE SUPPORT IN KIPS AT 0.2 INCH DEFLECTION — 30 INCH DIAM. PLATE — 10 REPETITIONS
REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
MINIMUM THICKNESS
LEGEND
RUNWAYS
TAXIWAYS, APRONS AND TURNAROUNDS
THICKNESS CURVES APPLY TO COHESIVE SUBGRADE SOILS AND ARE DERIVED FROM THE FOLLOWING DESIGN EQUATION BASED UPON LOAD TESTS (AT 10 REPETITIONS OF LOAD)
T=K LOG(P/S)
WHERE
T = REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
K = BASE COURSE CONSTANT AND HAS THE VALUE INDICATED FOR EACH WHEEL LOAD
P = APPLIED LOAD IN KIPS AT 0.5 INCH DEFLECTION FOR RUNWAYS AND 0.35 INCH DEFLECTION FOR TAXIWAYS, ETC.
S = SUBGRADE SUPPORT IN KIPS AT 0.5 INCH DEFLECTION FOR RUNWAYS AND 0.35 INCH DEFLECTION FOR TAXIWAYS, ETC., FOR SAME CONTACT AREA AS "P"
NOTE — IN GENERAL, THE VALUES OF CONE BEARING, HOUSEL PENETROMETER, FIELD C.B.R. AND ANGLE OF INTERNAL FRICTION INDICATED, APPLY TO FINE TEXTURED COHESIVE SOILS AND REPRESENT THE AVERAGE RATING FOR THE TOP 2 FEET OF THE SUBGRADE

FIG. 36. THICKNESS DESIGN CURVES for aeroplane wheel loads in terms of subgrade support at 0.2-in. deflection, cone-bearing, Housel-penetrometer, field-CBR, and triaxial-compression ratings, using Equation 1.

even upon 0.35-in. deflection for 1,000 repetitions.

It was indicated earlier, that for the same contact area, and for any given deflection over the range of 0.2 to 0.7 in., the loads carried at one repetition and 100 repetitions are 115 and 89 percent respectively, of the load supported at 10 repetitions. Over this deflection range, the load carried at 1,000 repetitions is 80 percent of the load supported at 10 repetitions.

Influence of subgrade compaction

The top two feet of the clay subgrade (L.L. = 35 to 50 percent; P.I. = 20 to 25 percent; Pass No. 200 = 65 to 85 percent) for a runway constructed in 1946 for a new airport at Saskatoon, Saskatchewan, were compacted to 95 percent of modified AASHO maximum density under rigid field laboratory control, and covered with an impervious mechanically stabilized base course which prevented the entrance of surface water. After exposure to one complete yearly cycle of weather conditions to permit reasonably uniform distribution of moisture through the subgrade, repetitive unconfined load bearing tests with a 24-in. diameter bearing plate were made in the summer of 1947 on the top of the uncompacted subgrade, on top of 12 in. of compacted subgrade, and on top of 24 in. of compacted subgrade (Fig. 40) at seven different locations.

A large number of field moisture and density tests in place at the seven load test locations, indicated that the average density of the compacted subgrade was 94.4 percent of modified AASHO maximum and its average moisture content was 114.2 percent of optimum. The corresponding average density and moisture content of the underlying uncompacted subgrade were 85.5 percent of maximum and 118.0 percent of optimum, respectively.

Briefly summarized, the load test data indicated that compacting a 12-in. depth of this soil from 85.5 to 94.4 percent of maximum density, increased the subgrade bearing capacity by approximately 25 percent, and gave the same increase in bearing capacity that would have been obtained from placing a granular base course 6 in. thick on the uncompacted subgrade. Compaction of the 24-in. depth of subgrade, increased the subgrade supporting value by about 38 percent, and provided the same increase in bearing capacity that would have been obtained from a 9-in. thickness of granular base course on the uncompacted subgrade.

The increase in subgrade bearing capacity due to compaction is probably influenced by the nature of the soil, degree of compaction as compared with the density of the uncompacted soil, soil moisture content and geographical and topographical location. While the data contained in this section were derived experimentally for the airport at Saskatoon, the quantitative values might be different for airport sites elsewhere, and should be employed with caution unless checked by actual field or laboratory tests for the location at which they are to be applied.

Evaluation of subgrade modulus

It is common practice at the present time to determine the value of the subgrade modulus k for rigid pavement design, from the load which the subgrade will support on a 30-in. plate at 0.05-in. deflection, in a simple static load test. In actual practice however, load is applied to the subgrade under a rigid pavement through a panel of rigid material about 10 ft. wide by 20 ft. or more in length. Furthermore, the pavement is subjected to not one load but to repeated applications of the wheel loads of traffic.

Fig. 18 (Part II) indicates that the unit load supported by a cohesive subgrade at any given deflection decreases as the size of bearing plate increases (P/A ratio decreases) Fig. 10 (Part I) demonstrates that the value of the subgrade modulus k decreases as the number of repetitions of load is increased.

It seems probable therefore, that the use of a simple static load test, and a bearing plate (diameter 30-in.) that is much too small, may result in values of subgrade modulus k that are considerably greater than the actual subgrade support that is provided for a rigid pavement.

In rigid pavement design, a granular base course is frequently placed between a cohesive subgrade and the pavement. This raises the problem of calculating what the subgrade modulus k at the top of any given thickness of granular base course will be if the subgrade modulus for the subgrade itself has been measured.

The loads carried by a 30-in. plate at 0.05-in. deflection for 10 repetitions of load on granular base course thicknesses of 7, 14 and 21 in. were plotted versus the loads supported on the underlying subgrade for the same conditions of test for a number of test

locations at several airports. Some scattering of data was observed, as is to be normally expected, since the corresponding base course and subgrade load tests at each test location were at least 10 ft. apart and the supporting value of the subgrade is not necessarily entirely uniform over even this small area.

It was observed that the straight line representing the equation $T = K \log (P/S)$ expressed the relationships between the plotted data reasonably well, and the most representative value for K appeared to be 80. (For a deflection of 0.5 in., all other conditions being the same, it was previously pointed out that the best value for K is 65, Figs. 30, 31 and 32, Part III).

Consequently, if the subgrade modulus k, for the subgrade has been measured, the subgrade modulus k_s at the surface of any given thickness T of well compacted granular base course can be calculated by means of the equation

$$T = 80 \log \frac{k_s}{k} \qquad (2)$$

If a bearing plate larger than 30-in. in diameter is employed to determine the subgrade modulus, which may be desirable for the reasons pointed out earlier in these articles, Fig. 33 (Part III) indicates that the value of the base course constant in Equation 2 will probably be larger than 80.

If a loose, poorly compacted granular base is employed, the supporting value furnished for a rigid pavement by the base course, k_s, may be even smaller than that of an underlying cohesive subgrade, k.

It cannot be too strongly emphasized therefore, that Equation 2 will only apply for a well compacted granular base course. Its density in place should be not less than 100 percent of modified AASHO maximum density at any point.

Test criteria for airport runways

The following plate bearing test criteria can be considered to apply when determining the thickness of granular base for runways, and for taxiways, aprons and turnarounds by means of Equation 1 for flexible pavements.

(a) Runway design for capacity operations: Load carried at 0.5-in. deflection for 10 repetitions.

(b) Runway design for limited operations: Load carried at 0.5-in. deflection for one repetition.

(c) Taxiway, apron, and turnaround design for capacity operations: Load carried at 0.35-in. deflection for 10 repetitions.

(d) Taxiway, apron, and turnaround design for limited operations: Load carried at 0.35-in. deflection for one repetition.

(e) The load supported at one repetition is 1.15 times the load supported at 10 repetitions for the same deflection and contact area.

(f) The load supported at 0.35-in. deflection is approximately four-fifths of that supported at 0.5-in. deflection for the same contact areas, and same number of repetitions of load.

(g) If the subgrade support is known for any given deflection and contact area, the subgrade support at that deflection for any other size of contact area can be calculated on the basis of the following two experimentally derived observations:

(1) A straight-line relationship exists when unit load is plotted versus the perimeter/area ratios (P/A) of

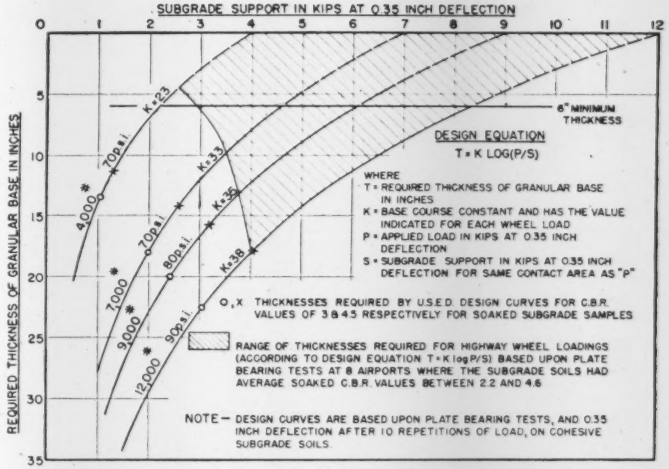

SUBGRADE SUPPORT IN KIPS AT 0.35 INCH DEFLECTION
REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
6" MINIMUM THICKNESS
DESIGN EQUATION
T = K LOG(P/S)
WHERE
T = REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
K = BASE COURSE CONSTANT AND HAS THE VALUE INDICATED FOR EACH WHEEL LOAD
P = APPLIED LOAD IN KIPS AT 0.35 INCH DEFLECTION
S = SUBGRADE SUPPORT IN KIPS AT 0.35 INCH DEFLECTION FOR SAME CONTACT AREA AS "P"
K=23
K=33
K=35
K=38
4,000
7,000
9,000
12,000
70 psi
80 psi
90 psi
O, X THICKNESSES REQUIRED BY U.S.E.D. DESIGN CURVES FOR C.B.R. VALUES OF 3 & 4.5 RESPECTIVELY FOR SOAKED SUBGRADE SAMPLES
RANGE OF THICKNESSES REQUIRED FOR HIGHWAY WHEEL LOADINGS (ACCORDING TO DESIGN EQUATION T = K log P/S) BASED UPON PLATE BEARING TESTS AT 8 AIRPORTS WHERE THE SUBGRADE SOILS HAD AVERAGE SOAKED C.B.R. VALUES BETWEEN 2.2 AND 4.6
NOTE — DESIGN CURVES ARE BASED UPON PLATE BEARING TESTS, AND 0.35 INCH DEFLECTION AFTER 10 REPETITIONS OF LOAD, ON COHESIVE SUBGRADE SOILS.

FIG. 37. CURVES FOR HIGHWAY LOADINGS based on the design equation for flexible pavements for airport loadings.

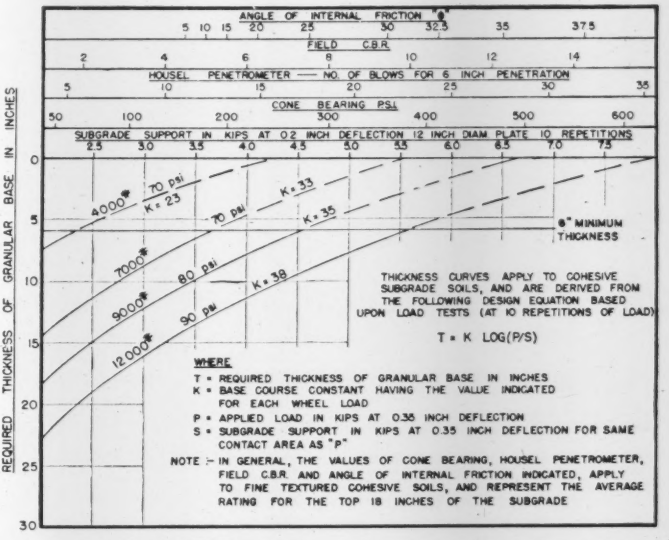

ANGLE OF INTERNAL FRICTION "ϕ"
FIELD C.B.R.
HOUSEL PENETROMETER — NO. OF BLOWS FOR 6 INCH PENETRATION
CONE BEARING PSI.
SUBGRADE SUPPORT IN KIPS AT 0.2 INCH DEFLECTION 12 INCH DIAM. PLATE 10 REPETITIONS
REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
6" MINIMUM THICKNESS
THICKNESS CURVES APPLY TO COHESIVE SUBGRADE SOILS, AND ARE DERIVED FROM THE FOLLOWING DESIGN EQUATION BASED UPON LOAD TESTS (AT 10 REPETITIONS OF LOAD)
T = K LOG(P/S)
WHERE
T = REQUIRED THICKNESS OF GRANULAR BASE IN INCHES
K = BASE COURSE CONSTANT HAVING THE VALUE INDICATED FOR EACH WHEEL LOAD
P = APPLIED LOAD IN KIPS AT 0.35 INCH DEFLECTION
S = SUBGRADE SUPPORT IN KIPS AT 0.35 INCH DEFLECTION FOR SAME CONTACT AREA AS "P"
NOTE — IN GENERAL, THE VALUES OF CONE BEARING, HOUSEL PENETROMETER, FIELD C.B.R. AND ANGLE OF INTERNAL FRICTION INDICATED, APPLY TO FINE TEXTURED COHESIVE SOILS, AND REPRESENT THE AVERAGE RATING FOR THE TOP 18 INCHES OF THE SUBGRADE
K=23
K=33
K=35
K=38
4,000
7,000
9,000
12,000
70 psi
80 psi
90 psi

FIG. 38. DESIGN CURVES for highway loadings in terms of subgrade support on a 12-in. plate at 0.2-in. deflection, cone-bearing, Housel-penetrometer, field-CBR, and triaxial-compression ratings, and using Equation 1.

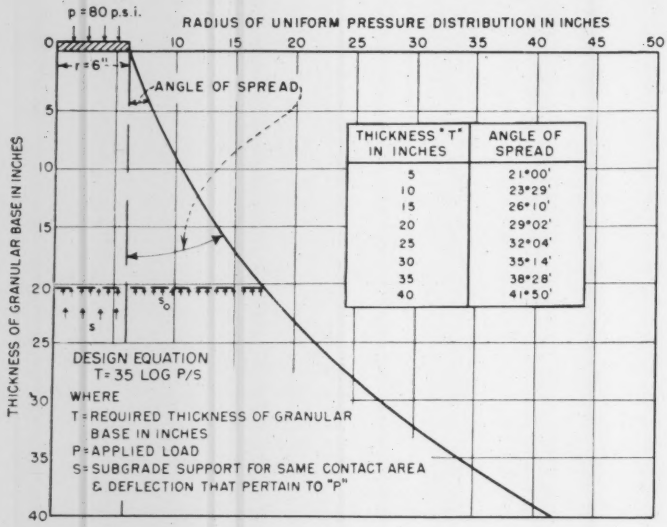


FIG. 39. ANGLE OF SPREAD of uniform pressure distribution given by the flexible pavement design formula applied to highway loadings.

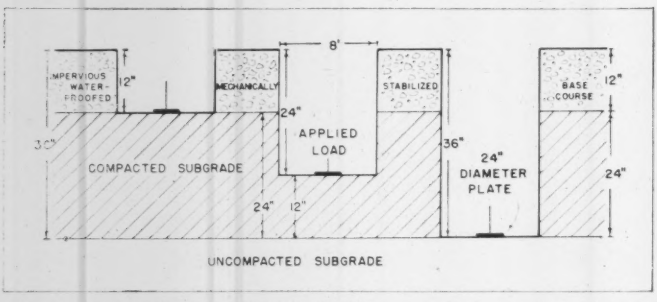


FIG. 40. ARRANGEMENT OF LOAD TESTS on compacted and uncompacted subgrades as used in studies of the influence of subgrade compaction.

bearing plates of different sizes at any given deflection.

(2) The slope of this straight line is such that the unit load on the 12-in. plate is twice that on the 30-in. bearing plate for any deflection from 0.2 to 0.5 in. (This observation is based on load-test data for Canadian soils and may require some modification for soils in other geographical areas).

(h) At any given deflection from 0.2 to 0.5 inch **for the same total contact area**, the load that can be supported on dual tires is about 33 percent greater than that on a single tire, if the thickness is about 6 to 10 in., and is about 25 percent greater if the thickness is about 15 to 20 in., provided the spacing between the center lines of the duals is at least twice the width of the tire.

The following plate-bearing test criteria can be applied to flexible pavement design for highways.

Test criteria for highways

(a) Highway design for a high density of traffic: Load carried at 0.35-in. deflection for 10 repetitions.

(b) Highway design for a low density of traffic: Load carried at 0.35 in. deflection for one repetition.

(c) Highway design for a particularly high intensity of traffic: Load carried at 0.35-in. deflection for 100 repetitions, or for 1,000 repetitions in exceptional cases.

(d) The load supported at 100 repetitions and at 1,000 repetitions is 0.89 and 0.80, respectively, times the load supported at 10 repetitions for the same deflection and contact area.

(e) Items (e), and (g) under the criteria for airport runways immediately above also apply to highway design.

Conclusions are not final

Although the various conclusions that have been outlined appear to be justified on the basis of data obtained in Canada so far, further investigation and experience may indicate that certain revisions or modifications should be made. This is a normal occurrence for investigations of this nature. It is not unlikely that these conclusions will sometimes require modification elsewhere, due to probable differences in behaviour under load of subgrade soils in other geographical regions.

While as a result of many years of experience with airport construction and performance in Canada, considerable disagreement with the method of flexible pavement design being currently advocated by the U. S. Corps of Engineers has been expressed, the writer feels that the Corps of Engineers deserves a great deal of commendation for the large amount of investigational work that it is performing and sponsoring in many phases of the field of soil mechanics at the present time. This research should eventually greatly extend our knowledge of the engineering properties of soils, and of pavement design.

Acknowledgments

General administration of this investigation was in charge of F. C. Jewett, Chief, Wartime Construction, Canadian Department of Transport until his retirement, and of Theo. Ward, Assistant Chief, Wartime Construction. Following Mr. Jewett's retirement, general administration came under the late Charles Flint, and is now under H. J. Connolly, Superintendent Construction. In their respective districts, the program has been carried on with the generous cooperation of district airway engineers E. F. Cooke, John H. Curzon, Homer P. Keith, W. C. MacDonald, George W. Smith and A. L. H. Somerville.

Special mention should be made of the very able assistance provided by C. L. Perkins, particularly, and by J. P. Walsh, D. S. Johnson, P. J. Prokopy, R. Applebaum, B. H. Newington, E. B. Wilkins, and D. Segal, in working up and correlating the test data.

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11. O. J. Porter, "Foundations for Flexible Pavements", Proceedings, Highway Research Board, Vol. 22, (1942).

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READER COMMENT

The Study of History

Sir: In your issue of April 21, p. 38 it is reported that James R. Killian, Jr., the new president of Massachusetts Institute of Technology . . . "believes that technically trained men should have a solid grasp of the humanities. . . . This was favorably commented upon by Winston Churchill. . ."

On this occasion at M.I.T., Mr. Churchill stated: "Four or five hundred years ago, Europe seemed about to be conquered by the Mongols. Two great battles were fought almost on the same day near Vienna and in Poland. In both of these, . . . Europe was completely shattered by the Asiatic hordes . . . But at the critical moment something happened—the great Khan died. . . . They never returned. . ."

Jengis Khan died in 1227. His empire reached from the Pacific west to the bank of the Dnjepr. The Mongols (Tatars), 14 years after his death, advanced more than 1000 miles westward. They beat the forces of the Polish princes at Sandomir and Cracow, and the forces of the confederated Silesian princes at Liegnitz on April 9, 1241. During February and March 1241, they burst through the Carpathian passes into Hungary, and beat the Hungarian army at Mohi Puszta in April (the greatest of the battles), captured Pest, crossed the Danube at Esztergom on Christmas day in 1241, and soon reached the coast of the Adriatic. Jengis' successor, his second son, Ogdai Khan died, after a lascivious life, on December 11, 1241. The Mongol troops were recalled in 1242.

The only battle near Vienna, during this period, occurred four years after the Tatars withdrew, on June 15, 1246, King Bela IV of Hungary defeated Duke Frederick II of Austria. The latter has seized western Hungary upon the retreat of the Tatars in 1242 as the price of assistance against them which had been promised but never given. Nineteen years later, in 1261, the Tatars invaded Hungary the second time but were routed, losing 50,000 men.

Two great Mongol battles occurred 708 years ago and both of them were fought 200 miles from Vienna. This, and the two or three centuries difference in the estimate of their time, are errors of smaller significance, however, than regarding the Mongols as Asiatic hordes. Their victories were won by consummate military strategy and with the full utilization of the national and international situation of the countries they attacked. History is the greatest teacher if it is honestly analysed in the search for the truth in its events.

Unfortunately, such historical analysis had no practical application during the past decades. Important decisions have been based on inaccurate and distorted pictures of the past. The sad condition of the world today is the result of the lack of historical perspective in the minds of statesmen. The study of history is, therefore, of great importance. It has to be learned, however, during the formative years of life, from 10 to 18, in order to leave a lasting cultural imprint. The belated underpinning of technical studies by humanities, now advocated, is an inefficient and faulty effort.

LOUIS BALOG
Consulting Engineer
Binghamton, N. Y.

Opposes Quantity Surveys

Sir: Mr. R. D. Sannit's proposed "Guaranteed Quantity Survey System" (ENR Dec. 9, p. 107) would set up licensed estimators as consultants to act in a manner similar to that of structural and mechanical engineers.

Following up Mr. Sannit's comparison, these licensed estimators would specialize also as do some of the engineers and we would have licensed structural estimators, licensed mechanical estimators, etc. They would eventually narrow their fields and the structural estimators handle only steel, reinforced concrete, piling or masonry, the mechanical estimators only plumbing, heating or other specialty, and then tend to handle only buildings, bridges, tunnels, marine structures, power plants or other single type of structure. Consider also the many divisions and subdivisions of estimators that would follow for shoring, demolition, non-ferrous metals, cabinet work, elevators, plastering, painting, etc. Engineers specialize because their general fields are too vast for them to cover properly. Licensed estimators would find the whole field simply impossible for them to handle.

What would be the requirements for a license? Would a man have to know how to prepare an estimate for any and all kinds of jobs and all branches of work? This would be impossible, especially if he is required, as Mr. Sannit states, to "list the materials and work for direct pricing in the exact manner used by each trade". To list the materials alone in some lines is a difficult task requiring long experience in the particular line. To list the "work" may also be difficult and is an important part of the listing. What good would a list of masonry, plumbing or paint materials for a complicated structure be to a contractor if the "work" is not also clearly listed? Furthermore, is the same kind of a list equally suitable for buildings, dams, airports, bridges, roads, power plants, railroads and municipal works?

There also are elements of an estimate other than "materials and work". Our licensed estimator could hardly be so familiar with methods of construction that he could list all the tools, equipment, storehouses, offices, fences, roads and the many other such items required to construct a large industrial plant one week, a bridge the following week, and then an office building, a sewer system and a school. If he can he is probably a specialist and does not know much about steel, concrete, bronze and plastering requirements for tunnels, dams, churches and housing. He could not be so familiar with supervisory personnel for all jobs that he could list the project managers, clerks, engineers, expeditors, superintendents and watchmen for a power plant one week, a cofferdam pier job the next, and then a road job, a housing project and the remodeling of a large department store building.

One could not list in detail all the federal, state and other tax and insurance requirements, regardless of where a job is located, and at the same time be well up on, say, formwork estimating for bridge piers, skyscrapers, airplane hangars and dams. What about bunkhouses, canteens, transportation and other facilities for the workmen and others at the job? If our licensed estimator can list all these in any suitable detail he is probably a commissary specialist and would be lost on listing elaborate aluminum decorations, pre-cast piles, curved plaster lighting coves, and oil refinery piping!

We have enough divisions and subdivisions of professions. Leave the estimators as they are. With so many types of jobs and branches of construction it is impractical for an estimator to have enough training and experience to do general estimating properly. A well established contractor wants all of the estimating done right in his own office where all the details of cost may be studied properly. In such an office the estimator is usually the center of activity and is a rather important person for other duties also.

GEORGE H. COOPER
140 W. 42*nd St.*
New York, N. Y.

BOOK REVIEWS

The Power of Atomic Bombs

MUST WE HIDE?—By R. E. Lapp. 182 pp. Addison-Wesley Press, Cambridge 42, Mass. $3.

Considering the effects of the atomic bomb in Japan and the Bikini tests, the author attempts to project these experiences to the use of A-bombs in future wars. His suggestions for reducing the effectiveness of the bombs are probably of most interest to the construction industry. Small cities (populations under 100,000) that do not contain a vital war industry, he says, are targets definitely unsuited for the power of the bomb for economic reasons. Thus, he believes, decentralization offers the best long-range solution for reducing vulnerability.

To be successful, dispersion must be planned, but not ordered or directed, the author claims. While broad principles applicable to all communities may be laid down, each city will have problems peculiar to itself that make a national master plan unfeasible. With the right impetus, a decentralization movement might start spontaneously and gradually reduce population and industrial concentrations, he believes.

Industry and residences should be spread out in closely knit, but not highly concentrated units. These might consist of a series of small groups of residential or industrial facilities spaced at least three miles apart. This arrangement, Mr. Lapp states, might also improve living conditions for many people.

Composite Materials Analyzed

ENGINEERING LAMINATES—Edited by Albert G. H. Dietz. 797 pp. John Wiley & Sons, New York; Chapman & Hall, Ltd., London. $10.

Properties of materials formed by bonding two or more laminates of the same or different substances are discussed in twenty-two chapters in this book, each written by an authority on the subject. While not new, engineering laminates have been growing in importance in recent years because they have unique characteristics that are now found useful or because they offer certain properties at less cost than for solid materials. Much of the progress that has been made is attributed to improved synthetic adhesives.

The first chapter presents the applied mechanics of laminates, including formulas for stress and strain in orthotropic materials based on a generalized form of Hooke's law. The second chapter covers the theory of adhesion, characteristics of the common types of adhesives and methods of applying, testing and curing. This is followed by two sets of chapters—one group devoted to laminates of essentially the same materials, such as wood or metals, and the second devoted to laminates of several different substances. The concluding chapter contains a description of methods of forming various laminates and sandwich materials.

A Text on Hydrology

RAINFALL AND RUNOFF—By Edgard E. Foster. 489 pp. The MacMillan Co., New York. $9.

As stated by the author, this book is a presentation of the science of hydrology, and as evidenced by the bibliography, reference has largely been made to reports of the American Geophysical Union, the American Meteorological Society and similar transactions.

Many statistical methods of analysis of precipitation data are given, which for the most part are much more elaborate than the precision of the basic data warrants. At the same time there are serious omissions in the text. For example: Evaporation is treated in extenso, giving complicated formulas for the relation between pan evaporation and evaporation from a given reservoir surface. However, nothing is said about the fact that in any reservoir there is one hundred percent collection of rainfall on the reservoir surface which will often very largely offset the evaporation.

Mr. Foster spends considerable time on formulas for computing floods and their frequency of occurrence. The reviewer some years back used some of these same formulas and computed for a certain river a "probable 288 year flood". It so happened that this computed flood was considerably exceeded twice in the next twenty years. Just another illustration of the vagaries of stream flow.

The author uses the system of moving averages to illustrate various long term trends in precipitation and it is interesting to note that several instances of graphs using moving averages were published in papers in the ENGINEERING NEWS-RECORD in past years.

"Rainfall and Runoff" shows a tremendous amount of work by the author correlating a wide variety of data and methods of hydrologic study. The reviewer has searched the text in an endeavor to find how the book might be used as a tool by practicing engineers and finds that although it is a most interesting and valuable book for an engineer interested in hydrologic research, yet he does not find it to be of too much help in the design of reservoirs and hydro-electric projects. —Reviewed by EDWARD H. SARGENT, chief engineer, Hudson River Regulating District, Albany, N. Y.

New Engineering Books

THE MUNICIPAL ENGINEER—By L. B. Escritt. 252 pp. George Allen & Unwin, Ltd., London; The MacMillan Co., New York. $2.

FAMILY HOUSING—By Deane G. Carter and Keith H. Hinchcliff. 265 pp. John Wiley & Sons, New York; Chapman & Hall, London. $4.

WELDING METALLURGY—IRON AND STEEL—Second Edition. By O. H. Henry and G. E. Claussen. 505 pp. American Welding Society, New York. $2.50.

ROUTE SURVEYING — Third Edition — By George Wellington Pickels and Carroll Carson Wiley. 434 pp. John Wiley & Sons, New York; Chapman & Hall, London. $4.75.

PHOTOGRAPHY IN ENGINEERING—By C. H. S. Tupholme. 276 pp. American Edition published by Chemical Publishing Co., Brooklyn, N. Y. $6.50.

OPERATIONS SANTA FE—By Merle Armitage. 263 pp. Duell, Sloan & Pearce, New York. $5.

DER STAHLBETONBAU—By Carl Kersten. 271 pp. Wilhelm Ernst & Sohn, Berlin, Germany.

GRUNDZUGE DES HOLZBAUES IM HOCHBAU—By Felix Fonrobert. 266 pp. Wilhelm Ernst & Sohn, Berlin, Germany. Price 9 DM.

WATER SUPPLY ENGINEERING — Fourth Edition—By Harold E. Babbitt and James J. Doland. 637 pp. McGraw-Hill Book Co., New York and London. $6.50.

BUILDING FOR MODERN MAN—A symposium edited by Thomas H. Creighton. 219 pp. Princeton University Press, Princeton, N. J. $3.50.

HANDBOOK OF PATENTS—By Harry Aubrey Toulmin, Jr. 800 pp. D. Van Nostrand Co., Inc., New York. $9.

(Continued on page 82)

"Give us the tools..."

YOUR ONLY CHANCE of Getting Ahead

Where is the "brave new world" so glowingly promised us by the politicians during and after the war? We were told then that postwar America would live 50% better than it had before. Why has that promise faded out? Why are men today discouraged and frustrated?

We have not yet made good 1944's promises because the *American worker turns out no more in an hour now than he did in 1941.* We are getting more total production in our country – but only because we have more people working. Not because each one of us is producing more. American industry's ability to turn out more and more goods – with less of each worker's time and effort – has been stymied for eight long years.

Progress has been blocked because in some cases workers have not been willing to work as hard as they did before the war. In other cases unions restrict the use of labor-saving machines and methods. In some places obsolete building codes and ordinances prevent advances. In still other cases progress has been blocked by collusive practices between unions and manufacturers or operators.

But the biggest block to progress is the fact that our industry in the United States has been unable to provide our workers with all the new tools and equipment that they need.

Increasing productivity – that is, each one of us turning out more in each hour of work – is the key to higher living standards. Productivity depends directly upon the kind of tools workers use. His tools, more than anything else, determine how much a worker can turn out; and what his paycheck will buy depends in large part on what he turns out—not on how long or how hard he works.

Look what happened in our country in the forty years from 1900 to 1940. Productivity of the United States *more than doubled.* It doubled because:

Business investment in capital equipment gave workers new tools – tools that had three and one-half times as much power –

So – Americans' living standard rose almost 50% while the average work week was dropping from 61 to 43 hours.

Industry did continue to raise its output per man hour, even in the depressed 1930's. But it did it because, with unemployment widespread, companies used only their most efficient equipment. *Actually the great depression saw industry fall far behind in the job of providing workers with new tools.*

Then came World War II. Few new tools for peacetime industry were produced. *As a result of depression and war, the U.S. fell behind in needed investment in new industrial facilities by more than $100 billion.*

Since the war business has spent almost $60 billion for new plants and equipment –

But the greater part of that money went to *expand* production to take care of the needs of our bigger population, and to *replace* plants and equipment that were worn out and ready to be junked at the end of the war.

continued on next page

Only a small fraction of the $60 billion went to *modernize equipment* – the equipment that increases efficiency and improves productivity of the individual worker.

Right now industry is desperately trying to do the job of increasing efficiency of machines so that each worker can turn out more.

McGraw-Hill's national survey of Business' Needs for New Plants and Equipment shows that manufacturers plan right now to spend in the 5 years ahead three-quarters of their capital funds to replace and modernize facilities. The biggest part of the more than $55 billion industry plans to spend on its plants and equipment will go directly to improve efficiency of the individual.

If industry can carry through its plans – and expand them as it would like to and as it must do – the U. S. can catch up on its depression-war-time lag in progress within a few short years.

If American industry is allowed to earn the money to buy the equipment, it can raise the American standard of living 50% in our generation – in the next 25 years. No other nation can promise its people that much – and deliver on the promise.

But the promise can only be fulfilled by American industry. Wherever you turn, industry has dramatic new ways of doing things. Using oxygen by the ton, steel makers are increasing production from blast furnaces by 20%. New high-speed machine tools are doing three times the work of 1940 tools. A new coal-mining machine will multiply a miner's daily output 10 times. Diesel locomotives do the work of three steam locomotives on many jobs.

New products – and larger production of standard products – are already making their impact on American life. Two million Americans will get new television sets this year. Automatic washing machines, electric dishwashers, and home freezers are easing the daily tasks of thousands of housewives. Millions of homes that did not have them before the war now have telephones, automatic heat and refrigerators. Frozen foods, nylon clothing – these and many other things coming along now – will shape the *real* new world for Americans.

But industry can provide them only if it can keep on investing at least $15 billion a year now – and more in future years – in new plants and equipment.

Today Washington is taking a course which, if pursued, will make that investment by industry impossible. Government spending now strains our resources to the limit, and more multi-billion dollar spending proposals are being piled on. *But government spending cannot improve American living standards.* It never has, and it never will. Increasing government spending *now* will only block progress, because the government proposes to pay for its plans by taxing away the profits industry is using, and must continue to use, to improve and expand its plants and equipment – our only hope for greater worker productivity and higher living standards.

Better living can only be paid for with more production. And we can only get more production by increasing productivity – by each one of us producing more for each hour of work.

The first thing is to get the production – in peace and in war – for better living – for security. Industry is planning to provide it – and is using $13 billion of its profits this year to improve and expand its facilities.

The only sensible, the only safe national policy is to make it possible for American industry to do its job – not to terrorize private industry with proposals of ruinous taxation and paralyzing controls and threats of nationalization. For American industry is not a thing apart from the American people any more than is government. American industry is the lifeblood of the American people and whatever makes industry do its work better contributes more to the common welfare than a bureaucratic government can ever hope to do.

James H. McGraw, Jr.

President, McGraw-Hill Publishing Company, Inc.

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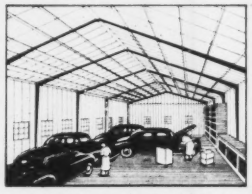

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Reports and Pamphlets

(Continued from page 80)

YOUR LAND—SURVEYS, MAPS & TITLES—Bulletin No. 71—By Fred C. Morris. Virginia Polytechnic Institute Engineering Experiment Station, Blacksburg, Va. $.75.

WATER METERING AND WATER ESTIMATING—Tenth Edition—By C. M. McCord. The Ambassador Co., Temple, Texas.

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EFFECT OF AIR ENTRAINMENT ON RESISTANCE TO FREEZING AND THAWING OF CONCRETE MADE WITH QUESTIONABLE AGGREGATES—By Fred F. Bartel—Circular No. 31, National Sand and Gravel Association, 1325 E. St., N.W., Washington 4, D. C.

EFFECTS OF VARIOUS ADMIXTURES ON AIR ENTRAINMENT, WATER REQUIREMENT AND COMPRESSIVE STRENGTH OF CONCRETE—By Delmar L. Bloem. Miscellaneous Publication No. 22, National Ready Mixed Concrete Association, 1325 E St., N.W., Washington 4, D. C.

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Choose a DUAL PRIME it's the Self-priming Centrifugal that's better 4 WAYS!

1. CMC DUAL PRIME PUMPS assure unmatched self-priming speed. Faster self-priming is the result of the exclusive CMC dual jet construction and advanced centrifugal design. Two jets mean peak performance at all times.

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Only three basic pump parts . . . case, impeller and rotary shaft seal. When pump is worn, merely replace impeller and wear plate to obtain new pump performance.

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Maximum flexibility and versatility is a characteristic of all CMC DUAL PRIME PUMPS. A wide range of sizes to fill your every need is available from $1\frac{1}{2}$ inch to 10 inch—from capacities of 3,000 to 200,000 gallons per hour.

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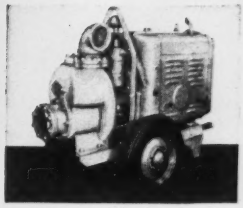

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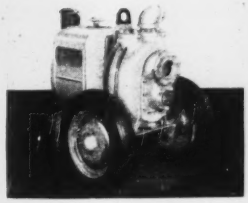
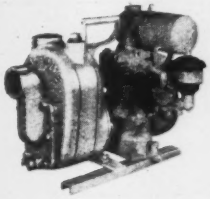
FOR ROUGH AND RUGGED JOBS!

This rugged CMC pump is built to stand up to the most rigorous conditions. Designed to assure continuous operation, Model 40M is powered with 20-25 H.P. liquid cooled engine. Available on skids; also steel or pneumatic wheels. It is capable of capacities up to 40,000 gallons per hour.

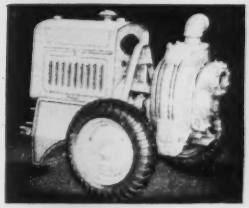


CMC MODEL 10M
HEAVY DUTY 2-INCHER. Built for longer service, Model 10M 2" pump is an ideal general purpose pump. Available on skids, pneumatics or Disc wheels. This self-priming unit incorporates features guaranteeing maximum capacity of performance. Powered with a 3-4 H.P. air-cooled 4-cycle engine, the 10M is capable of capacities up to 10,000 gallons per hour.



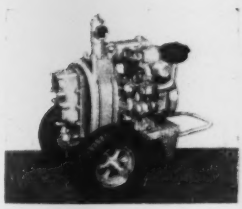
CMC MODEL 90M
WORLD'S BEST 6" SELF PRIMER!

This self-priming centrifugal unit is used extensively for pumping out quarries, pipe line and sewer work as well as large construction jobs. Powered with a liquid cooled six cylinder engine with oil bath, air cleaners and oil filters, this CMC 90M is capable of capacities up to 90,000 gallons per hour.



CMC MODEL 30M

HERE'S VERSATILITY PLUS! A pump of wide usefulness and built for heavy-duty service, Model 30M has all the exclusive features that have made CMC first choice in contractors' pumps. Powered by 12 H.P. engine this CMC dual prime unit is capable of capacities up to 30,000 gallons per hour.



CMC MODEL 3M

Here's new dependability in light weight pumps. Famous dual prime feature in handy, easily portable units for a wide variety of uses. Model 3M has a capacity of 3,000 gallons per hour and is powered by a 1 H.P. engine.

CONSTRUCTION MACHINERY CO'S.
WATERLOO, IOWA, U.S.A.

CMC equipment is sold and serviced by leading equipment distributors everywhere

NEW PRODUCTS

Cable-controlled Hopper

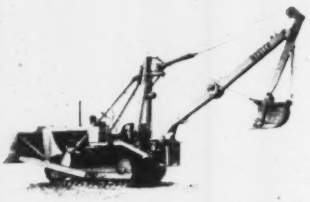
A new Terra Cobra Wagon, Model TC-W14, is announced. It is available complete with 200 hp. Terra Cobra Model TC tractor, or as wagon unit Model W14 only, designed for quick interchange with scraper unit on all models of Terra Cobra self-propelled scrapers. With a heaped capacity of 20.0 cu. yd., and 14.0 struck, the tapered bottomless hopper spot dumps to rear, or spreads to desired lift by moving back on roller tracks. Positive fore and aft motion of body is effected by air controlled cables reeved without reverse bends in such a manner as never to contact load. Cable is accessible at all times. Hopper, which will pass rock up to 48 in. dia., and stationary chassis bottom plate are of heavy abrasion-resistant alloy steel. The hopper is ruggedly braced on all sides. Massive rear wheel brakes operate from two air reservoirs on wagon, and set if air supply is interrupted.—Wooldridge Mfg. Co., Sunnyvale, Calif.

New Plastic Coating

Phenoplast, a phenolic resin plastic finish, has several unique advantages that should make it especially useful to the construction industry for plywood formwork for concrete, protection of floors and prevention of corrosion in industrial atmospheres. Applied by brush or spray, this liquid not only coats the surface but becomes practically an integral part of the material to which it is applied. It is a cold-setting, transparent plastic that gives all the protection of a baked-on finish: It resists abrasion, water, heat and cold, and chemicals. When used over metal or painted surfaces, it must be applied over a special plastic-base primer. Phenoplast costs $12.50 per gal. retail, and one gallon covers about 500 to 700 sq. ft. per coat. Two coats generally are required.—L. Sonneborn Sons, Inc., Bldg. Products Div., 80 Eighth Ave., N. Y. 11, N. Y.

New Building Brick

"Chem-Brick" is a building brick new in formula and process of manufacture. It is a hard dense, silica-base brick made by a new, closely controlled process that assures uniform quality, strength and size plus proper product curing. "Chem-Brick" is a radically new all-purpose material for the construction of partitions, walls, chimneys and back-ups for both residential and commercial buildings. It meets A.S.T.M. grade SW specifications for first quality brick.—Detroit Brick and Block Co., St. Jean Ave., Detroit, Mich.

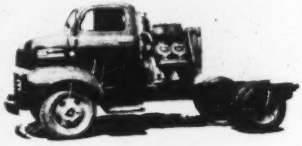


Hoe Front

First shipments are now being made of a ½-cu.yd. capacity hoe front, newly added to the dragline, clamshell, and crane features of the Hyster Hystaway, attachment for use with "Caterpillar" track-type tractors. Installation of the hoe front on the D7 and D8 Hystaway can be accomplished without major alterations to existing machines. The hoe dipper has a cutting width of 33 in. and for narrow ditching an optional dipper of 28 in. width may be substituted. Because the center of swing is beyond the crawlers, the hoe can reach farther into the excavation than other conventional machines of comparable size. Full tractor mobility, maneuverability and conversion characteristics, are completely retained with the new hoe front. Quick change-over from one front end attachment to another is possible. It takes only one hour to dismount the Hystaway to allow full production bulldozer use. The unit may be mounted on the tractor in about two hours, following the initial installation.—Hyster Co., Portland 8, Ore.

Pipe Wrench

New lightweight heavy-duty pipe wrench named "Roxo" has only four parts. Engineered design involves new patterns, dies and metallurgical formula. Claimed to be lighter in weight and stronger than comparable wrenches of similar types. Made only in 14-in. size at present, although other sizes will soon be in production.—Trimont Mfg. Co., 55-71 Amory St., Roxbury, Boston 19, Mass.



Truck-Mounted Compressor

New 160-c.f.m. "Auto-Air" compressor is driven direct from truck engine through a heavy-duty power take-off, thus eliminating need for separate driving engine. Compressor is of the V-type with three low-pressure cylinders and one high-pressure cylinder. It is 46 in. long, 67 in. wide and 50 in. high, occupying only about one-third of the truck body space. Unit, including take-off, weighs 1,600 lb.—Davey Compressor Co., Kent, Ohio.

Electric Stairways

A new standardized electric stairway installation in the J. C. Penney store in Seattle, Wash., calls attention to the fact that these conveniences are now in use in many retail stores throughout the country. The stairway is capable of moving 5,000 shoppers an hour between any two floor levels as it travels 90 ft. a minute at a 30 deg. angle. The unit's driving machinery is mounted inside the top end of the 6,500-lb. structural steel truss. New features include a simplified track system, structural steel brackets instead of machined castings, and a new-type sheave, or driving wheel. — Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.

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111-M MARION

DIESEL POWER WITH ELECTRIC SWING AND AIR CONTROL

It has what it takes to get big jobs done quickly!

IT'S FAST! IT'S POWERFUL! IT'S ECONOMICAL!

Put this husky 3½-4 cubic yard machine to work on your toughest construction jobs. The MARION 111-M is setting production records across the country. It's a blend of speed, power and economy that gets big jobs done quickly. Delivery dates?—earlier than you might think. Why not check your nearest MARION District office or agent today?

NEW — The MARION 111-M is now available as an all-electric machine with full Ward-Leonard Control.

from ¼ cu. yd. to 45 cu. yds.

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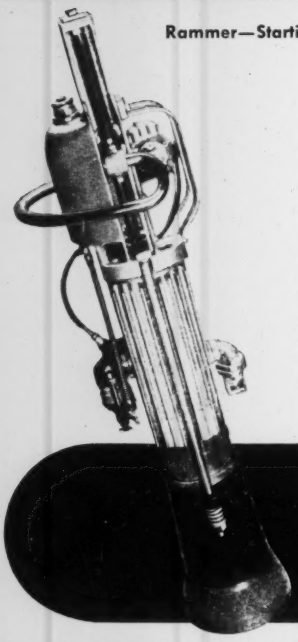
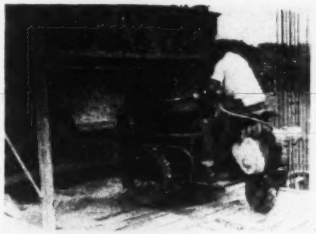


The new Barco Rammer is faster and more effective than any other type of tamper. It is easier on the worker, enables him to get more work done in less time, and at *lower cost.* Although rollers may do the compaction on large projects, they cannot reach locations close to abutments, culverts, walls and so on. But the new Barco Rammer remedies this situation, gives specified compaction. On large backfill tamping where a ditcher is used, the Barco Rammer works quickly and effectively. Today, with Federal, State and City authorities, as well as private corporations devoting more and more attention to these problems, the best answer is the Barco Rammer —the *entirely new* machine with the *entirely new method* of securing soil compaction. For more information write Barco Manufacturing Company, 1814 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO

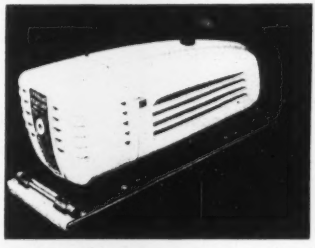
GASOLINE RAMMER

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY



Power Cart

Designed to replace hand-pushed concrete carts and wheelbarrows on construction jobs, the GAR-BRO power cart has proved its usefulness on any job where bulk materials are to be moved. A 7-hp. 4-cycle gasoline engine enables the cart to climb 20 percent grades with a 2,000-lb. load. All moving parts have been equipped with Timken tapered roller bearings. Improvements have been made in the forward and reverse clutches giving additional life and smoother, easier operation. Also several changes in frame design make the improved model stronger without additional weight. Steering is done by a tiller which turns the rear wheel through a 180-degree arc, enabling the machine to turn around in a 4-ft. radius. Large front wheels carry the bulk of the load and allow operation over rough ground. The basic tray carries 9 cu. ft. of concrete; with side boards, 12 cu. ft. A mechanical foot brake and foot-operated tray-release latch are standard equipment. Speeds of 8 to 10 mph. are attained. Weight empty is 685 lb. with a load rating of 2,000 lb.—GAR-BRO MFG. CO., 2416 E. 16TH ST., LOS ANGELES, CALIF.



Electric Sander

The Century, a new, low cost portable electric sander, weighing only 4¾ lb. and featuring a non-stalling, high speed motor encased in a streamlined die-cast aluminum alloy housing, operates on the "orbital motion" sanding action principle enabling the operator to control the exact amount of surface material to be removed. This permits sanding of parallel boards with opposing grain structures without risk of grit scars. The unusually light and compact 4 in. high machine

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Sanitary engineering has achieved notable progress in stream pollution control during the past half-century. Sewage treatment was introduced in 1899, the year our Company was organized. Today, more than 6,000 sewage treatment plants serve over half of our urban population. And substantial progress is being made in decontaminating industrial wastes discharged into streams and other waters.

Water supply and gas service have also made notable contributions to better health and living in the past 50 years. Today, more than 12,000 public water supply systems serve 85 million people with safe and palatable water. More than 20 million families are furnished with gas for cooking and heating.

After 50 years of manufacturing cast iron pressure pipe primarily and principally for water, gas and sewerage service, we too can point to a record of progress. In pioneering new and better production methods, such as the centrifugal process of casting—in improved quality controls—and in facilities for research and development. Cast iron pressure pipe as produced today in our several foundries bears witness to that progress—in terms of strength, toughness and uniformity.

To those responsible for the great progress in water supply, gas and sanitation service and their contribution to better health and living over the past fifty years, America pays tribute.

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U. S. Pipe & Foundry Co.
Makers for 50 years of cast iron pipe for water, gas and sewerage service.
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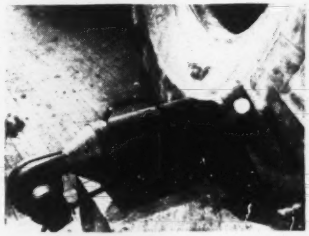
reduces operator fatigue without sacrificing the stamina and power necessary in a production sanding tool for surface removal or finishing of wood, metal, composition and plastic products and parts. Due to its small size and low clearance, the Century can sand up to corners and trim or under low obstacles without risk of damage. Because of its light weight it can be operated in an inverted position where necessary. Low cost and sanding speed 3 to 10 times faster than hand methods offer marked cost-cutting opportunities. Additional economy results because standard size abrasive sheets cut in thirds are used and as many as four or five sheets can be loaded on the pad at one time. —Sterling Tool Products Co., 1340 No. Milwaukee Ave., Chicago 22, Ill.



Quick Tire Repair

A new method of repairing injuries to off-the-road tires where the damage does not extend too deeply into the tire. It can be used without removing the tire from the vehicle. This is accomplished with a light, portable hot air blower or vulcanizer (electrically operated), that vulcanizes a special rubber into the injury without physical pressure. The equipment is known as the Schlegel Air-Welder. Weighing only 17 pounds, it cures without pressure and may be used on the job or anywhere that electric current is available.—R. E. Schlegel Inc., 114 E. Exchange St., Akron, Ohio.

Bucket Controls

New bucket controls for the Multi-Foote Paver are designed to be used with the bucket on the MultiFoote High Lift boom and are mounted on the bucket itself. They permit the smooth operation of the bucket doors for any degree of opening, allowing the delivery of anything from a shovelful to the full bucket load of concrete. The man spotting the bucket can thereby deliver the desired amount of material with an accuracy that is impossible where control must be exercised from the paver deck. This is particularly advantageous when feeding direct to a Pumpcrete, where the whole bucketload cannot be delivered at once and where the feed of the

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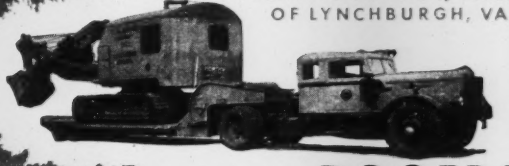
DOES IT WITH A ROGERS

using a Rogers Model D-35-D and a Pole Type Trailer loaded with 80,000 lbs. of steel tank 67 feet in length. The conventional trailer mounts a fifth-wheel type of bolster which supports the front of the load and tows the pole trailer which carries the rear of the load.

A. B. BURTON CO., Inc. OF LYNCHBURGH, VA.



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Moving this heavy Northwest power shovel from job to job presents no problem to the A. B. Burton Co. when they have their D-50-D Rogers semi-trailer to rely upon.

DUIE PYLE OF COATSVILLE, PA.

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Another 40 tons of tank 70 feet in length is rapidly transported the 70 mile distance from Lancaster, Pa., to Telford, Pa., with a Rogers popular D-35-D semi-trailer and a PT-15 pole trailer taking the job "in stride".

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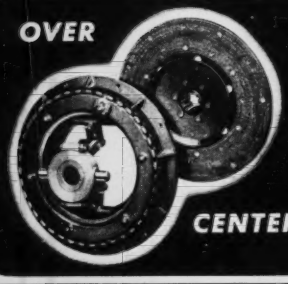

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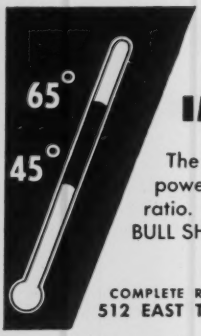

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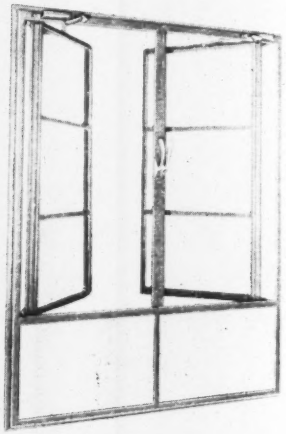
IMMERSION METHOD
(PATENTS PENDING)

The Immersion Method will lower plant cost, lower power cost, and maintain accurate water-cement ratio. It is now in use on 2,100,000 c. y. pour at BULL SHOALS DAM, MOUNTAIN HOME, ARKANSAS.

ROYAL McSHEA
COMPLETE REFRIGERATING PLANTS ENGINEERED, SOLD, AND ERECTED
512 EAST TWENTY-FIRST STREET . . . WICHITA 2, KANSAS

Pumperete must be watched, or to hoppers, spouts or concrete buggies that cannot handle the full bucket capacity.—THE FOOTE CO., BLAW-KNOX SUBSIDIARY, NUNDA, N. Y.



Steel Casement Windows

Specially designed sections of new billet, hot-rolled steel, providing unusual strength as well as a trim appearance, are features of residential steel casement windows. Rain and wind are defied by the double-contact weathering. Easy-operating, new-type hinges have supporting wrap-around leaves as well as offset faces. Flash-welded corners guarantee tight-smooth joints and bring neatness and a streamlined uniformity to the windows. Latest methods of projection welding also assure positive location of ventilators and protect against sag or distortion. Smooth-working crank mechanism controls the ventilators. Modern hardwares completes the streamlined appearance of this window.—COPCO STEEL AND ENGINEERING CO., 14035 GRAND RIVER AVE., DETROIT, MICH.

9-lb. Masonry Drill

A new feature has been added to the Cleco Handi-Drill, the 9-lb. masonry drill that hits as it rotates. Development is announced of retainer type star drills which fit directly into the drill to give a direct drive on the steel. This permits the drilling of holes up to 1¼ in. An assortment of retainer type star drills is now included in the Handi-Drill kit.—CLECO DIVISION OF REED ROLLER BIT CO., HOUSTON, TEX.

WHEN OTHER BUCKETS HAVE GONE TO SCRAP . . .
. . . HENDRIX ARE STILL PRODUCING PROFITS!

- ★ Full Payload Every Trip . . . FOR MORE PROFIT!
- ★ Rugged All-Welded Construction . . . LOWER MAINTENANCE COST.
- ★ 12% Manganese Steel Chains and Fittings . . . STANDARD ON ALL TYPES and SIZES.
- ★ A Type for Every Job . . . light, medium, and heavy-duty. WITH OR WITHOUT PERFORATIONS.

Combining rugged construction, larger capacity, and low maintenance cost, HENDRIX DRAGLINE BUCKETS turn payloads into profits on every job. Dragline operators prefer Hendrix Buckets, because they are efficient and have proved their ability to dig more dirt at less cost. Long life and low maintenance cost result in bigger profits on all jobs. *Hendrix Dragline Buckets are tough . . . they're made to "take it!"*

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

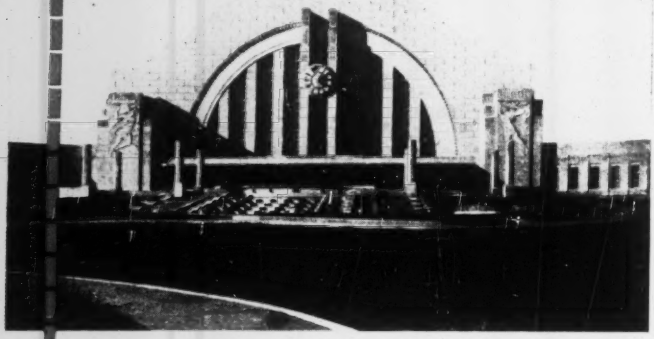
For descriptive literature ask your dealer or write

HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

SUPPORTED BY CREOSOTED FOUNDATION PILES

carrying 30 to 35 tons each!



Passenger Station of the Cincinnati Union Terminal, Cincinnati, Ohio.

CINCINNATI'S Union Terminal was completed in 1933 at a cost of $41,000,000. This tremendous railroad terminal was constructed on a filled site; therefore, it was necessary to found almost all of the structures on piling. Nearly 10,000 creosoted pine piles, ranging from 45' to 65' in length, were used. Today, each of the creosoted foundation piles is *still* carrying 30 to 35 tons . . . *without settlement in the heavy fill.*

During the construction of this project, because the heads of all timber piles were so far above ground-water level, engineers of the Terminal Company made an exhaustive study of the permanence of creosoted wood piles. Their conclusion: pressure-creosoted wood, when embedded in earth, regardless of the moisture in the soil, *may be considered as permanent construction.*

Also, competent authorities have estimated that the use of creosoted timber piles undoubtedly accounted for a saving of close to $500,000 over any other type of permanent piles which could have been used in this construction.

Many Koppers Pressure-Creosoted Foundation Piles were used in this project. Naturally, Koppers is proud to have had a part in once again proving that creosoted pile foundations are both permanent and economical.

KOPPERS COMPANY, INC, Pittsburgh 19, Pa.

KOPPERS PRESSURE-TREATED WOOD

Manufacturers' Publications

Electrical Connections—An 8-page catalog describes the Cadweld process for electrical connections, a method of welding copper to either steel or copper, in which no outside source of heat is required. These connections are not subject to the gradual loosening or corrosion of mechanical joints, have a current carrying capacity equal to or greater than the conductor, and are made with lightweight, inexpensive equipment, and no special skill is required for their use. Well illustrated, the catalog shows the various types of welders together with equipment requirements for such connections as formed terminal; horizontal and vertical surfaces; "T" and ground. — ELECTRIC RAILWAY IMPROVEMENT CO., 2070 E. 61ST PLACE, CLEVELAND, OHIO.

Corrosion Prevention — Dissolved oxygen is the primary cause of corrosion in most water systems. A brochure tells about Corrogen, catalized sodium sulfite, which has a complete reaction time in the cold of 20 seconds, reducing dissolved oxygen to zero. It prevents corrosion in hot and cold water distribution lines and affords corrosion protection in compressors, Diesel engines, feed lines and economizers.—W. H. & T. D. BEIZ, PHILADELPHIA 24, PA.

Glass Block—Adding value to apartment buildings by means of glass block is the theme of a folder which explains how Insulux Glass Block panels are fire resistant, solve problems of illumination, minimize drafts, insulate, and provide the noise protection and privacy so important to apartment dwellers. It is also claimed that the material reduces fuel bills and lowers decorating costs. — AMERICAN STRUCTURAL PRODUCTS CO., SUBSIDIARY, OWENS-ILLINOIS GLASS CO., TOLEDO 1, OHIO.

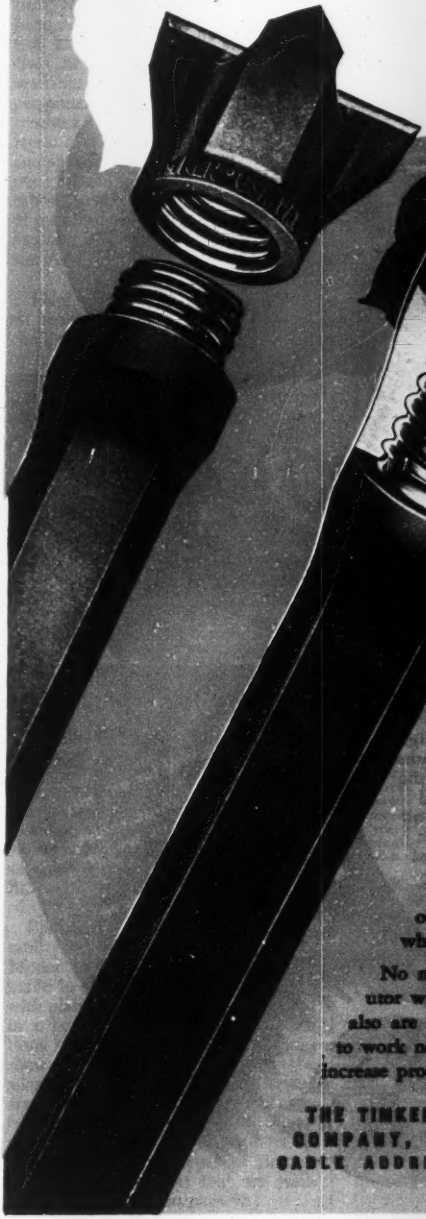
Radial Saws—6-page folder on radial saws for wood, plastic and metal includes action and feature photos, model listing, accessories and prices. Also shown are standard components which are available for setting up high speed production line cutting. — WALKER-TURNER DIVISION OF KEARNEY & TRECKER CORP., PLAINFIELD, N. J.

Portable Compressor—4-page folder describing "Auto-Air" compressor con-

(Continued on page 95)

You Have The Rock

We Have The BIT



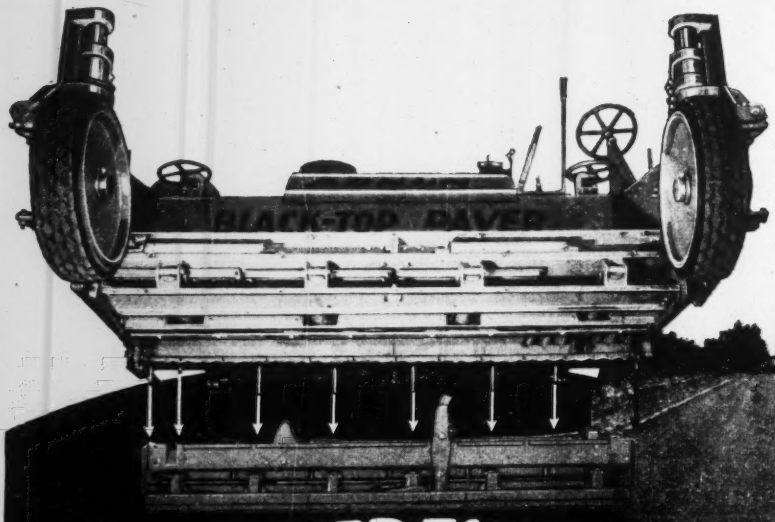
Get them together and you will have the formula for greatly reduced drilling costs. It doesn't matter what kind of rock it is; there's a Timken Rock Bit to match and master it—including a carbide insert bit.

What makes the Timken Bit superior for rock drilling? (1) a removable principle that has proved its correctness by more than 14 years service under all rock drilling conditions in mines and construction work. (2) Timken Steel developed especially for Timken Rock Bits and produced in our own steel plant. (3) Timken metallurgical "know how" in heat treatment and hardening. (4) uniform quality and performance; every Timken Bit will give the same outstanding service in speed of penetration and depth drilled when used in the same kind of rock.

No matter where you are there's a Timken Rock Bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken Bits to work now—cut drilling costs, increase production.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO
CABLE ADDRESS "TIMROSCO"

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

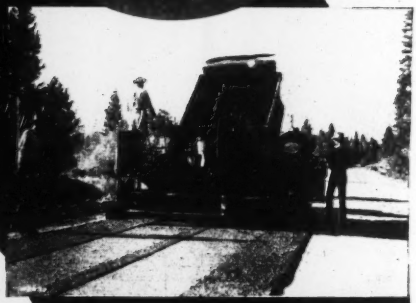


Below Top: Here is a smooth, dense job laid by an Adnum.

Below: The Adnum is far more accurate because it operates from the finished surface.

THE DIFFERENCE

that assures Better Black Top Pavement!



THE Adnun Black Top Paver brings you features of design that mean better black top pavements. The Adnun Cutter Bar is different in that it is provided with teeth! These teeth combined with the oscillating motion "strike off" the material with a smooth *sawing action.* This action eliminates the drag that causes tearing and beveled edges on the teeth provide an initial compaction!

Here is a combination of advantages that assures the dense, tight surface necessary for long life and resistance to traffic and weather.

The rotating Breaker Bar, combined with the design of the Cutter Bar makes it possible to handle the very tough cold materials that make such fine pavements, such as Kyrock, and which other machines find difficulty in laying. Hopper design and Cutter Bar adjustments permit laying narrow sections of pavement and "feathering the edges" for smooth widening on crowned surfaces.

The Adnun brings you mechanical advantages no other Black Top Paver can bring you and combines them with lower cost upkeep and greater versatility. Don't buy a Black Top Paver without securing complete details.

- Full control for any mix.
- Lays stone, chips, cinder, soil cement, as well as black top.
- Retractable wheels save time in relocation.
- End Gates and Cutter Bar extensions handle materials beyond ordinary widths.

THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1922 State Street Nunda, New York

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER

A BLAW-KNOX PRODUCT — FROM FORMS TO PAVER TO FINISHER ALL YOUR PAVING EQUIPMENT — IN ONE PACKAGE FROM BLAW-KNOX

tains complete specifications of 60-105-160-210-315 c.f.m. truck-mounted units. It lists the various body types available and contains illustrations of 10 typical assemblies.—DAVEY COMPRESSOR CO., KENT, OHIO.

Revere Metals — 63-page booklet gives in non-technical language the basic technology of copper, brass and bronze. It has been issued for distribution to employes and sales representatives of the company, but is also available to production and technical personnel in other companies, and to teachers in technical schools and colleges. Among the topics are copper and its alloys; cold working and hardness; annealing, corrosion, and specifications. Included is a 7-page glossary of metallurgical terms.—REVERE COPPER AND BRASS, INC., 6500 E. SLAUSON AVE., LOS ANGELES, CALIF.

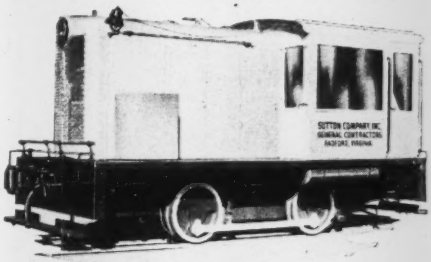
Hard Water Troubles—A booklet on zeolite water softeners and ion exchangers describes the troubles caused by hard water, outlines the properties of ion exchangers, explains and illustrates the most up-to-date ion exchange equipment. A description of the new manually or automatically controlled multiport valve is also given. — THE PERMUTIT CO., 330 W. 42D ST., NEW YORK 18, N. Y.

Pole Buyers' Guide—An 18-page technical bulletin is a guide for buyers and users of poles. Pole specifications for all species as established by the American Standards Association and accepted by the largest pole users are presented in detail. The booklet gives the manufacturing requirements for bark removal, sawing, trimming, framing, and marking poles, and defines widely used wood terminology. Five tables of dimensions for different species of poles are included, and a diagram of the measurement of sweep and short crooks in poles. Proper unloading to prevent injury to workmen or poles.—WOOD PRESERVING DIVISION, KOPPERS CO., INC., KOPPERS BLDG., PITTSBURGH 19, PA.

Portable Belt Conveyors—The versatility, adaptability and capacities of Model 363 portable belt conveyors made in lengths of 25, 30 and 35 ft. with plain or cleated belts, are outlined in a booklet. Two pages of applications suggest possible uses. Drawings show how the conveyor may be adapted to many conditions. Stressed are the extra quality materials and careful construction of the "363." Noteworthy features are described. One page outlines other types of Barber-Greene belt conveyors that are avail-

(Continued on page 98)

Where a Project Calls for RAILS



Wisdom calls for DAVENPORTS

A Davenport Better-Built Locomotive will give you flexible, always available haulage power for record work accomplishment at lowest ton-mile costs. Whatever the size and type you require, a Davenport will put Profit-Power on your rails.

Better Built DAVENPORTS *are AVAILABLE in* STEAM GASOLINE DIESEL *with* ELECTRIC *or* MECHANICAL DRIVE

WE ANALYZE YOUR NEEDS

It will be a pleasure to send you our latest Haulage Survey Data Sheet to enable you to describe your haulage conditions accurately and completely. Our engineers will analyze the data you submit and recommend the power unit that will perform most profitably for you.

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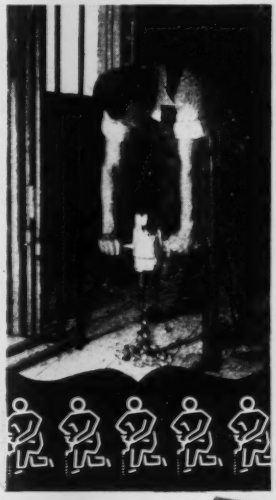
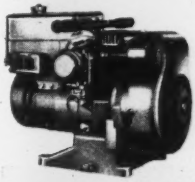
DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA
ESTABLISHED IN 1900

1 MAN CAN DO THE WORK OF A CREW...
with an
ONAN PORTABLE ELECTRIC PLANT



Use fast-working, cost-cutting electric tools on every job. Lightweight, Onan air-cooled, engine-driven electric plants supply instantly-available power *anywhere* for lights, drills, saws, pipe threaders, planers, spades, and tampers. Carry 'em, wheel 'em, or truck 'em right to the spot and plug-in for all the power you need. Equipped with carrying handles or dolly-mounted.



A.C. Models: 350 to 35,000 watts.
D.C. Models: 1200 to 15,000 watts.
Diesel Plants: 2,500 to 55,000 watts.

ONAN ELECTRIC PLANTS

Send for Catalog

D. W. ONAN & SONS INC.
5390 Royalston Ave., Minneapolis 5, Minn.

Send your catalog on Portable Electric Plants

NAME_____
ADDRESS_____
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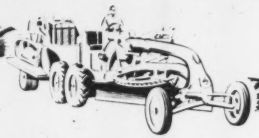
HD-5 TRACTOR

HD-5 TRACTOR with Tracto-Shovel and its interchangeable attachments—1 cu. yd. standard bucket, ¾ cu. yd. narrow bucket, 2 cu. yd. snow loader bucket, 1 cu. yd. rock bucket, bucket teeth, heavy-duty bulldozer blades, V-type snowplow.

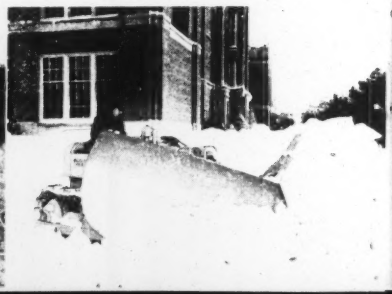
Wrap up

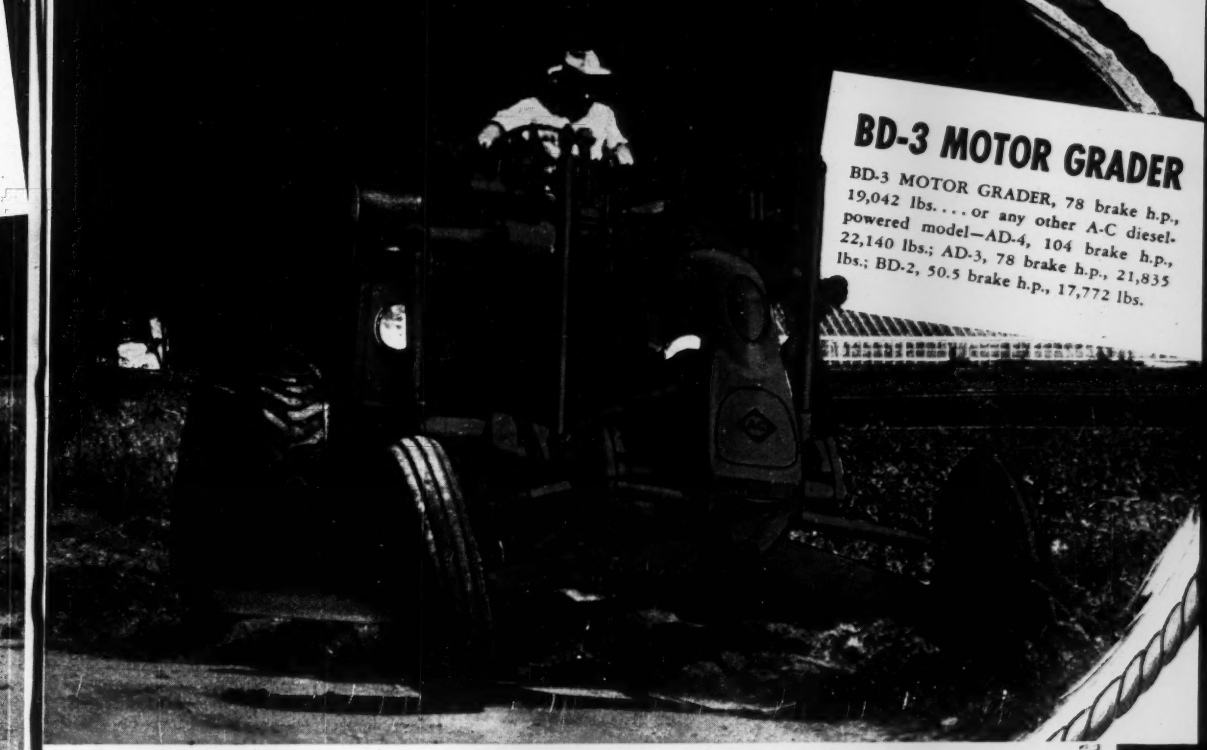
YOUR YEAR 'ROUND PROBLEMS *with this*

EQUIPMENT PACKAGE



Reduce your equipment investment with this equipment package. No need to have a number of specialized machines for various jobs. Any maintenance work . . . and much of your construction . . . material handling . . . snow removal and loading are quickly, efficiently done with this versatile combination—AT BIG SAVINGS. Let your Allis-Chalmers dealer tell you all about this LOW COST, BUDGET STRETCHING PLAN . . . NOW!





BD-3 MOTOR GRADER

BD-3 MOTOR GRADER, 78 brake h.p., 19,042 lbs. . . . or any other A-C diesel-powered model—AD-4, 104 brake h.p., 22,140 lbs.; AD-3, 78 brake h.p., 21,835 lbs.; BD-2, 50.5 brake h.p., 17,772 lbs.

SOME OF THE JOBS YOU CAN DO WITH JUST THESE TWO MACHINES

- Clean and shape-up ditches
- Cut and smooth backslopes
- Handle regular maintenance
- Widen and reshape roads
- Make driveways and bridge approaches
- Build berms
- Scarify roads and streets
- Backfill pipe, culverts, bridges
- Take out cuts
- Remove and load sod
- Load surplus dirt from shoulders and ditches
- Remove and load topsoil
- Make fills
- Handle bulldozing
- Make channel changes
- Plow, move and load snow from roads and streets, alleys, parking lots, cemeteries, institutions
- Skid trees
- Load rocks and stumps
- Dig and load dirt
- Load sand, gravel and other material
- Mix black-top
- Do crane work
- Handle all types of hauling or pulling
- Straighten out curves
- Open and rebuild alleys and streets
- Build parking lots
- Cut away embankments obstructing sight

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

How To Build Floors of RATED Strength and Fire-Resistance

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THE ONE AND ONLY ALL-STEEL OPEN WEB BAR JOIST WITH THE NAILABLE TOP CHORD

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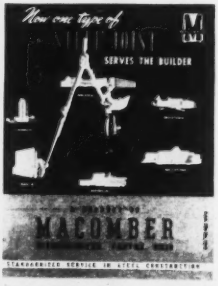
It's The MACOMBER V BAR JOIST

DESIGNERS prefer the universal application of this one steel joist to any floor system whether it be wood, tile, terrazzo or concrete.

BUILDERS like this all-steel joist that holds nails better than wood, requires no form work, eliminates delays and reduces service line installation time.

OWNERS appreciate the earlier occupancy possible, the reduced construction costs and insurance rates. Catalog on request. →



V-BAR JOISTS AND PURLINS • V-STUDS • TRUSSES • LONGSPANS • DECKING

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IN CANADA, SARNIA BRIDGE CO., LIMITED, SARNIA, ONT.
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STANDARDIZED STEEL BUILDING PRODUCTS

able and pictures typical installations in which B-G equipment is used to reduce handling costs of bulk materials. —BARBER-GREENE CO., AURORA, ILL.

Dragline Buckets—A revised edition of "How to Get The Most Out of a Page Automatic Dragline Bucket" is now available. This 20-page booklet details information on dragline operations. How to select the right size bucket, how the bucket operates, how to use it and care for it to get maximum production, are a few of the subjects discussed and illustrated. — PAGE ENGINEERING CO., CLEARING POST OFFICE, CHICAGO 38, ILL.

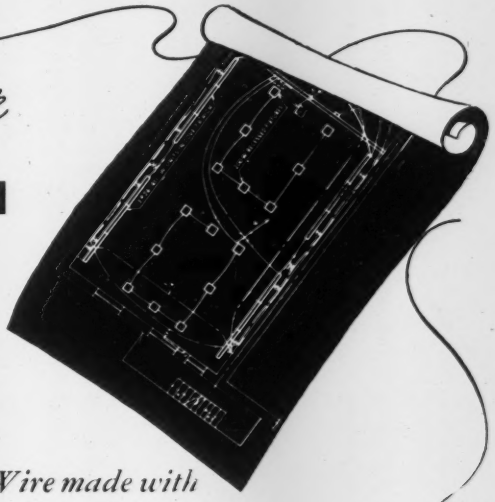
Cord Conveyor Belts—Featuring material on its Cord conveyor belts, which it claims have many advantages over those made with conventional fabric in the most rigorous services, a new 6-page catalog section on conveyor belting has been published. The catalog section fully describes construction of the Cord belt, which the company says has from two to six times the impact resistance of fabric belts, and lowers belt and conveyor costs when installed. Features of the belt are lines of parallel cords, each completely coated with rubber, giving the plies of cord and rubber practically the same impact resistance as the cover because the cords can spread apart under a blow.—THE B. F. GOODRICH CO., AKRON, OHIO.

Architectural Concrete Units—A handsome booklet gives photographs and data showing the use of architectural concrete units on the Prudential Building, Los Angeles, Calif., the exterior of which is built of these units with fluted terra-cotta window spandrels. The remarkable whiteness of the units is achieved by the use of Trinity White portland cement and white quartz. — GENERAL PORTLAND CEMENT CO., 111 W. MONROE ST., CHICAGO 3, ILL.

Chlorine Dispensers—A catalog section describes the new F & P Chlorinator for which it is claimed that it is safe, accurate, inexpensive and mechanically simple. It is a dry vacuum chlorine dispenser which uses no water seals, bell jars, poppets or similar devices. Filtered chlorine is delivered to the Ratochlor unit at a controlled pressure of —20 in. W.C. Flow rate is set by adjusting a packless, needle-type regulating valve, and is measured accurately by a flowrator meter methodically calibrated to indicate pounds per day of chlorine vapor. Dispensers are produced in 17 standard sizes of capacities of 10 lb. per day to 7,500 lb. per day.—FISCHER & PORTER CO., HATBORO, PA.

A Good plan for

INDUSTRIAL and COMMERCIAL WIRING INSTALLATIONS



Use Rubber-Covered Building Wire made with

FIBERGLAS* *Yarns*

EASIER INSTALLATION and LONGER LIFE at NO PREMIUM

For permanence . . . and for customer satisfaction . . . on industrial and commercial wiring installations . . . it's a good plan to use rubber-covered building wire made with Fiberglas glass yarns . . . because Fiberglas yarns:

- **DON'T ROT**
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- **DON'T PROVIDE FOOD FOR RODENTS**
- **DO HAVE THE INHERENT CORROSION-RESISTANCE OF GLASS**

For your satisfaction, too, you can depend on Fiberglas yarns to perform to your credit whether you are the architect, the engineer, or the contractor on the job—or the wire manufacturer.

Consider, too, that rubber-covered building wire made with Fiberglas yarns:

- **PULLS EASIER**
- **LASTS LONGER**

Nonmetallic—sheathed building cable made with Fiberglas yarns offers the same advantages.

Consult your supplier and satisfy yourself about the superior performance of building wire and cable made with Fiberglas yarns.

OWENS-CORNING FIBERGLAS *Yarns*

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OWENS-CORNING FIBERGLAS CORPORATION, Textile Products Division, Dept. 52, 16 East 56th Street, N.Y. 22. In Canada, Fiberglas Canada Ltd., Toronto, Ontario

HARBOR **Harborite**

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The Superior Multiple Re-Use Concrete Form Panel

And for other concrete form job requirements, Harbor offers three more star performers, all backed by Harbor's name and Harbor's reputation—

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SUPER-Harbord PLYCRETE—Grade-marked: EXT • DFPA • AA. For multiple re-use form work. Hot-press-bonded with phenol-type resin adhesive. ALL veneer jointed. All open defects in crossbands repaired. Re-humidified after pressing. Sanded smooth both sides. Edge-sealing and oiling optional.

★ ★

Harbord PLYCRETE—Grade-marked: INTERIOR • AA • DFPA. Harbord PLYCRETE has the same veneer faces as SUPER-Harbord Plycrete, but is bonded with 10-cycle moisture resistant glues instead of water-proof adhesives. Sanded smooth both faces. Will withstand many re-uses. Factory edge-sealing and oiling optional.

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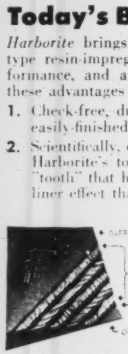
Harbor PLYFORM—Grade-marked: PLYFORM • DFPA • BB. Bonded with water-resistant 10-cycle glues (not waterproof). Both faces are BB (solid) veneer, free from open defects. Sanded smooth. Factory edge-sealing and oiling optional.

4 Star Features make Harborite Today's Better Concrete Form Panel

Harborite brings you top concrete form performance! Phenolic-type resin-impregnated overlays for smoother, longer, better performance, and a core of genuine SUPER-Harbord give you all these advantages —

1. Check-free, durable overlay surfaces which result in desirable, easily-finished concrete surfaces.
2. Scientifically, exclusively designed and manufactured by Harbor, Harborite's tough, serviceable, abrasion-resistant overlay has a "tooth" that holds oil, sealers or lacquers . . . has an absorptive liner effect that reduces pit voids.



3. *Harborite's* distinctive reddish-brown color is permanent—will not bleed or discolor concrete . . . reduces finishing problems.
4. You get maximum panel re-use at the lowest cost-per-foot-per-use.

Demand Harborite for really re-usable panels, for incomparable concrete form work, for definite savings in concrete form work.

For information concerning Harborite and other Harbor Concrete Form Panels, contact:

HARBOR PLYWOOD CORPORATION, Hoquiam, Washington

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PNEUMATICALLY PLACED CONCRETE
DENSE · DURABLE · HIGH STRENGTH

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Restoring Disintegrated Concrete
Dam, Dock and Bridge Repairs
Steel Encasement and Fireproofing
Sewer, Water Pipe and Penstock Linings
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420 LEXINGTON AVE., NEW YORK 17, N.Y.
MURRAY HILL 3-7699

Men and Jobs

Marshal McCord has succeeded **Elmer J. White** as resident engineer for the J. E. Greiner Co. on the construction of the Mystic River Bridge in Boston, Mass.

Robert D. Carpenter, who has served as city planner for Fort Wayne, Ind., has resigned, effective June 15.

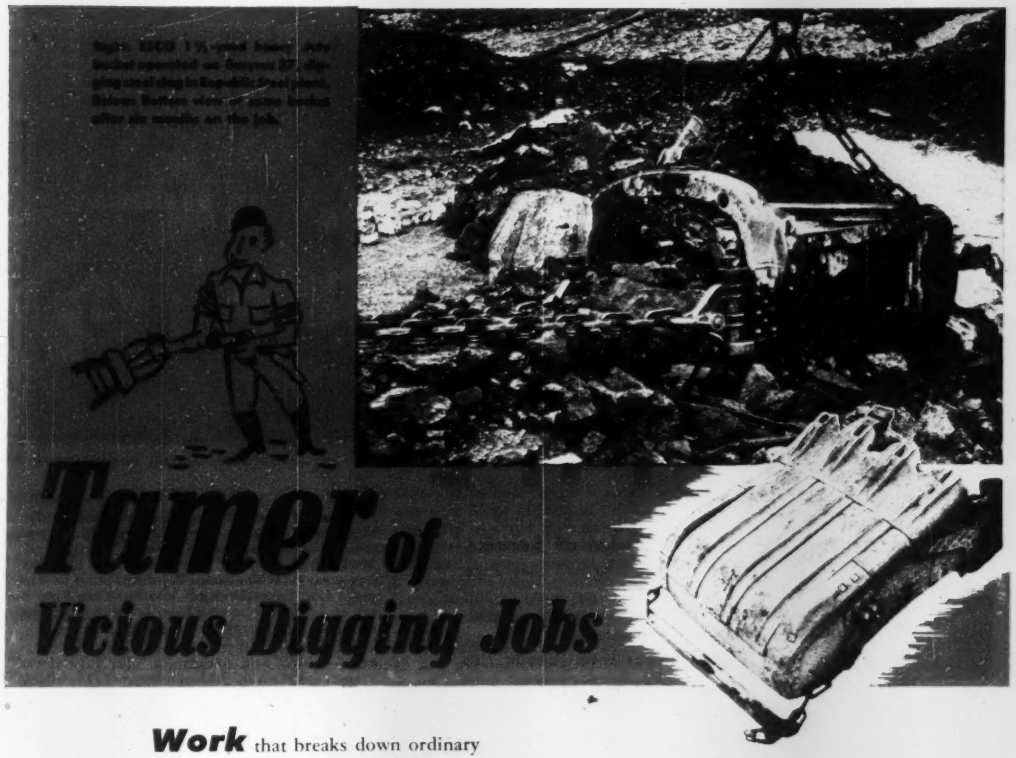
Edward E. Morris, civil engineer for the Bitter Root National forest, has gone to Caracas, Venezuela, to advise the Venezuelan government on methods of building a secondary highway system in the Andes mountains. The new roads will be similar to U. S. forest service roads. Morris was loaned to Venezuela by the forest service.

James D. McIntosh, Jr., of Charlotte, N. C. has been named city manager of Lancaster, S. C., to succeed **Lott C. Rogers,** resigned. A graduate in civil engineering from Clemson College, he has been employed by J. N. Pease and Co., Charlotte engineering and architectural firm.

John J. Fitzpatrick is now vice-president of the Robt. R. Anderson Co., contractors and engineers, Chicago, specializing in paving and heavy construction. Mr. Fitzpatrick for 10 years was field engineer for the Portland Cement Assn. and later was with the Marquette Cement Mfg. Co.

Col. Claude H. Chorpening, district engineer of the Tulsa district, Corps of Engineers, has been assigned to the office of Chief of Engineers in Washington, D. C. During his three-year assignment with the Tulsa district, Colonel Chorpening brought to completion the new $10,000,000 Canton Reservoir and construction was started on the Fort Gibson, Hulah, Heyburn, Tenkiller, Wister and Fall River reservoirs. For the last few months he has been acting chief of the Dallas division office. Colonel Chorpening is a graduate of West Point; the Engineer School, Fort Humphreys, Va., and the Command and General Staff School at Fort Leavenworth, Kan. He is a veteran of World Wars I and II, and in the last conflict served in both the European and Pacific theaters.

Gerald A. Lewis of Halifax, N. S., has been appointed chief construction supervisor of the Nova Scotia Housing Commission.



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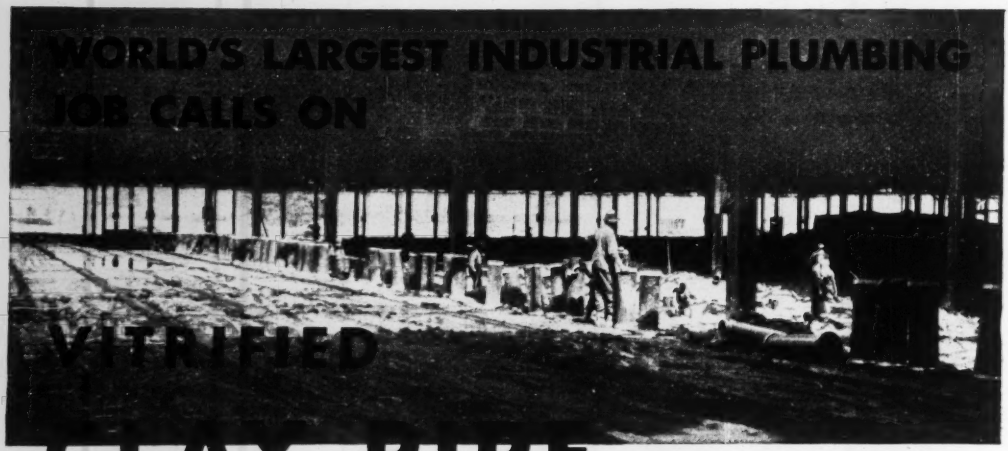

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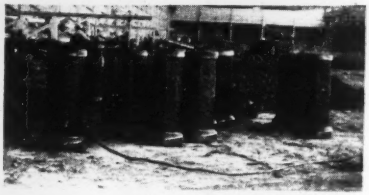

Henry Jordan, Cedar Falls, N. C. has been appointed chairman of the North Carolina State Highway and Public Works Commission. He will serve until May, 1953.

Edwin M. Loseth is the new resident engineer for the South Dakota State Highway Commission, at Webster. He replaces **A. L. Stutenroth,** who resigned to become superintendent of bituminous and gravel construction for C. A. Wagner Construction Co., Sioux Falls.

Walter F. Winters, district highway engineer for the Washington State Highway Department at Seattle, has resigned to join the Asphalt Institute at Denver, in charge of special projects.

Patrick B. Smith, city engineer, Coffeyville, Kan. has been appointed city engineer and director of utilities.

James C. Stewart, Project Engineer for the Oak Ridge National Laboratory, Oak Ridge, Tenn., has been appointed to succeed Leonard E. Johnston as Manager of the U. S. Atomic Energy Commission's Area Office at Schenectady, N. Y. Mr. Johnston, former AEC Manager at Schenectady, has been named manager of the Commission's New Reactor Test Station, near Pocatello, Idaho.

Mr. Stewart has been engaged in engineering and construction work for the Atomic Energy Project at Oak Ridge continuously since Jan. 1944. Except for five months in 1946. He served first as an officer in the Manhattan District of the Corps of Engineers, and later as a Civilian Official for the Monsanto Chemical Co. and the Carbide and Carbon Chemicals Corp. He has been project engineer for the Oak Ridge National Laboratory —which Carbide and Carbon operates as contractor—since February. He has been responsible for coordinating construction design of new laboratory and processing facilities. From Jan. 1948, to Feb. 1949, he was general superintendent of the laboratory's engineering and maintenance division.

V. R. Currie has been named commissioner of works and city engineer of Kingston, Ont.

Irving Quinn has been appointed chief engineer of the Design Co., 50 Broad St., New York City. He succeeds Frank Hogan.

Joseph Unger of Dayton has resigned as chief engineer for the Ohio highway department's bureau of location and design to become manager of the Dayton office of the Carroll & Ed-

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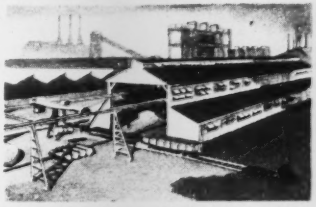

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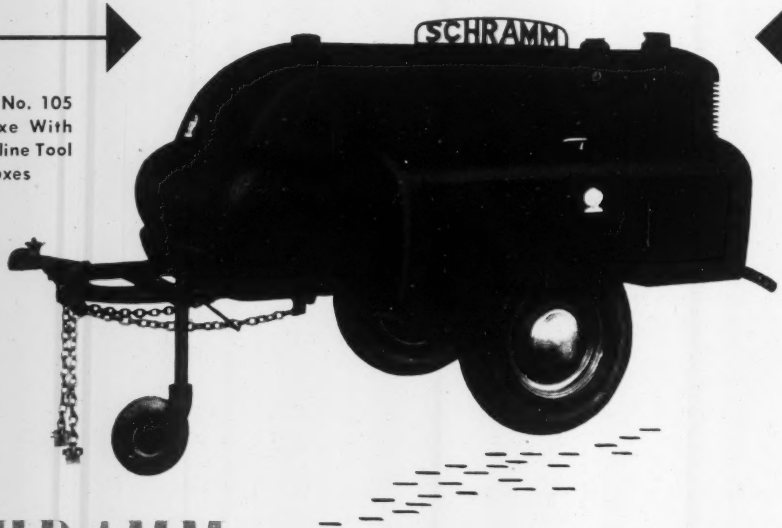

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wards Equipment Co. His successor is **Karl L. Rothermund.**

Milton M. Kinsey, former president of the Board of Public Service, St. Louis, Mo., and **Harry C. Brockhoff,** who was the city's director of public utilities, have formed a consulting engineering firm. **Frank J. McDevitt** succeeds Mr. Kinsey and **C. B. Briscoe** Mr. Brockhoff. **Frank Kriz** is director of streets and sewers in place of **A. C. Meyers.**

William Kauffman, formerly with Andrew Catapano, New York contractor, has rejoined the John W. Stang Corp. at its western headquarters in Bell, Calif.

Bertram J. Hoare, 65, St. Louis, Mo., retired recently after 25 years service with the division office of the U. S. Corps of Engineers, Department of the Army. Since 1945 he had been safety-engineer.

George H. Shearer, who had been Seattle district engineer for the Washington State Highway Department 18 years until he was transferred to Vancouver, Wash., last year, has been returned to the Seattle position to succeed **Walter F. Winters,** resigned to join the Asphalt Institute at Denver. **D. D. Forgey,** construction engineer for the Seattle district, will replace Shearer at Vancouver.

Lt. Col. Lynn W. Pine, who has been with Headquarters IX Corps, Sendai, Japan, for the last 32 months, has come home for reassignment. In Japan, Colonel Pine was executive officer for the engineer, and engineer, IX Corps.

Col. Edward G. Daly, Charleston, S. C., district engineer with the Corps of Engineers, has been named to succeed **Col. C. H. Chorpening,** Tulsa, Okla., district engineer. Colonel Chorpening will head the personnel division of Army Engineers at Washington, D. C.

Eugene L. O'Brien is assistant director of the Illinois department of public works and buildings. He is a graduate of De Paul University.

Harold T. Nelson, assistant regional director of the Bureau of Reclamation at Boise, Idaho, since 1946, will become regional director July 1, replacing **Robert J. Newell,** retiring. A graduate of the University of Idaho, Nelson was a member of the engineering faculty of Montana State College before joining the bureau 13 years ago, rising to the post of construction engineer on the Roza Division of the

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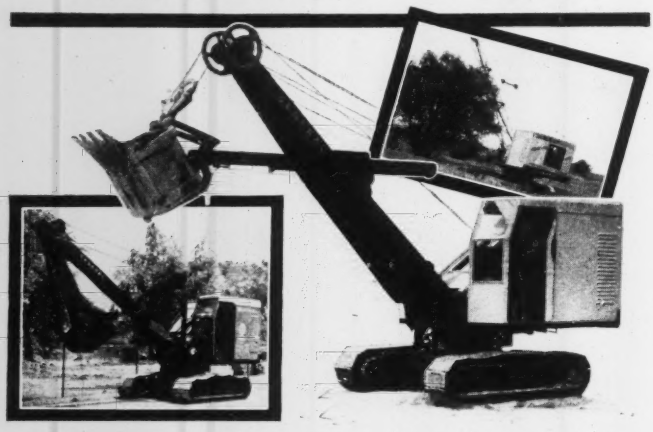

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Yakima Project before being transferred to Boise. Newell, who received his engineering degree from Highland Park College, started on the Minidoka Project in Idaho, then left the bureau from 1908 to 1923 to engage in private engineering work. Since 1923 he has worked on a number of bureau projects, becoming regional director in 1945.

Personnel changes in the Pennsylvania Highways Department: Appointment of **Frederick O. Yohn** as resident engineer in the Williamsport district; **Walter S. Millard** as project engineer in the Pittsburgh district; and resignation of **Donald J. McIntyre**, as resident engineer in the Hollidaysburg district.

Warner E. Dunlap has been appointed division construction engineer for the Department of Highways and Public Works of Tennessee for Division #1 at Knoxville, succeeding the late John Bernard Hawley. He had been assistant division construction engineer at Knoxville for about 18 months. A graduate of the school of engineering of the University of Tennessee, he has been connected with the highway department for 20 years, and prior to his transfer to Knoxville was senior resident engineer at Memphis, his last assignment being on the new highway bridge across the Mississippi.

Leo H. Corning has succeeded the late Arthur J. Boase as manager of the structural and railways bureau of the Portland Cement Assn. at Chicago. He has been assistant manager since 1935. He received his B.S. and C.E. degrees from the Case Institute of Technology and was an officer instructor in engineering subjects in the first world war. Later he was engineer of design for the Cleveland Water Department, and structural engineer with the Foundation Co., Chicago.

Michael J. Sinnott of St. John's has been named Minister of Public Works in the Newfoundland provincial government.

Chas. M. Kelley has opened an engineering office at 456 Main St., Athol, Mass. A graduate of Northeastern University, he was with the U. S. Engineers in the West Indies and also in Alaska. Last year he was foreman-engineer for Gallo Const. Co. on the 4-mile highway relocation around Union Village Dam, Vt.

Robt. H. Seymour is engineer of Sumner County, Kan., succeeding **Rufus Kirk** who becomes Sedgwick County highway engineer.

Welded Tubular Structure Eliminates Separate Pipe System

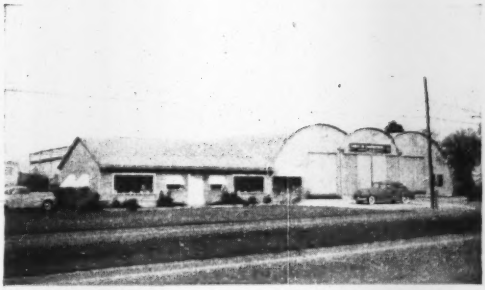

Fig. 1. All welded quonset hut type of factory building built for Forsyth Engineering Company, Houston, Texas. Unique interior tubular construction designed by owner, J. M. Forsyth.

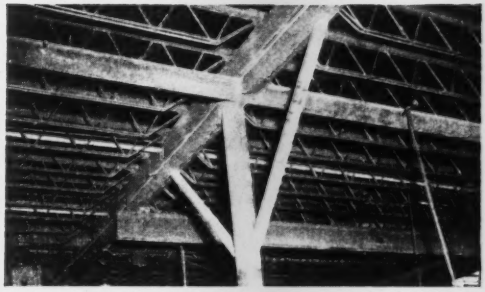

Fig. 2. Tubular columns and beams for crane support serve also as air receiver and a piping system for compressed air at storage pressure of 100 pounds per square inch.

By Harry K. Smith
Big Three Welding Equipment Co., Houston, Texas

STRONGER structures are being erected today faster and at less cost with arc welding. Often, additional benefits can be derived at little or no extra expense with arc welding, as illustrated in the construction of the machine shop for the Forsyth Engineering Company at Houston, Texas (Fig. 1).

The all welded tubular construction used for the crane support for this plant not only provides the necessary rigidity with lighter members and less steel, but acts as an air receiver and piping system, storing over 500 cubic feet of air at pressures in excess of 100 psi. This results in the elimination of air storage tanks and piping system.

Columns and beams (Fig. 2) are fabricated from 5" NE 8649 alloy pipe readily available in this section of the country. Single column supports are used in the center of the crane support and double columns are used at the outer walls. Two-inch pipe is welded between the double columns to act as bracing and by-pass to allow compressed air to enter both column members. An I-beam (Fig. 2), welded to the top of the beam, provides more head room and affords better footing for joists.

All piping is fitted up for pressure-tight joints. Edges are beveled 30° and welded with 3 passes of Lincoln "Shield-Arc LH-70" electrode for dense, porous-free welds in alloy steel. Nipples are fillet welded to horizontal and vertical pipe members for take-off connections.

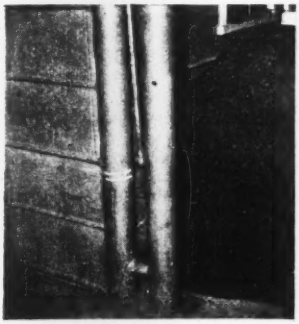

Fig. 3. Double column support with 2" cross-over pipe permits air storage in both column members. Nipple at floor is for draining off water.

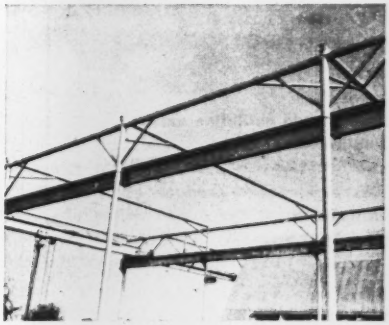

Fig. 4. Five-ton outdoor crane runway built over material storage yard. Provides rigid support with light members. Delivers air to yard for paint spraying.

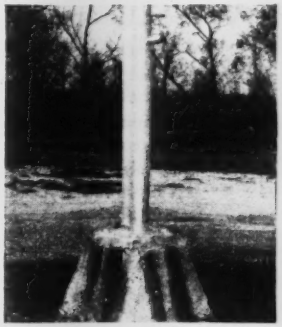

Fig. 5. Column anchor detail for yard crane runway. Flange plate is fillet welded all around to column pipe. Shows compressed air take-off.

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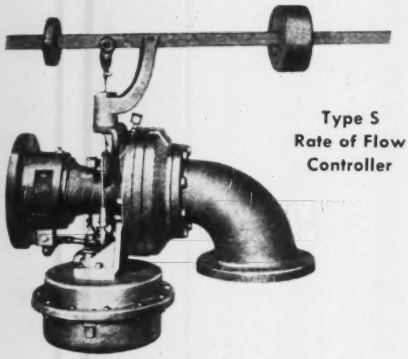

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Elections and Activities

The new Ridgefield, Conn., Contractors Association has elected these officers: President, Raymond M. Keeler; vice-president, William Browse; secretary, Mario Serfilippi; and treasurer, Joseph Zwierlien.

Presentation of the New England award to U. S. Senator Ralph E. Flanders of Vermont for being the distinguished engineer of the year featured the annual dinner and meeting of the Engineering Societies of New England, held recently at Northeastern University in Boston. President James R. Killian, Jr., of the Massachusetts Institute of Technology was principal speaker. William C. White, dean of Northeastern day colleges, presided.

Akron chapter, Ohio Society of Professional Engineers, has elected A. W. Carpenter, manager of the physical testing laboratories, B. F. Goodrich, as president; D. W. Converse, president-elect; R. D. Landon, vice-president; O. E. Hermanns, treasurer, and J. J. Konopka, secretary.

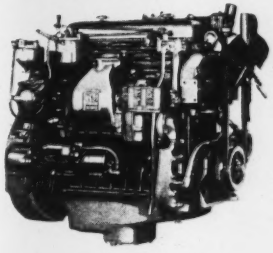
Marshall P. Crabill, purification superintendent of the Indianapolis Water Co., has been elected chairman of the Indiana Section of the American Water Works Assn. Jack Gordon, Rochester water works superintendent, was elected vice-chairman. Re-elected were Charles H. Bechert, secretary-treasurer, director of the division of water resources of the Indiana conservation department, and George G. Fassnacht, assistant secretary, chief of the water division of the Indiana board of health.

Thomas L. Watts, Waycross, has been elected president of the Southeast Georgia chapter of the Georgia Society of Professional Engineers. He succeeds Lawrence Miller, Brunswick. Other officers: E. A. Logan, Ocilla, state representative; H. A. Norman, Brunswick, secretary-treasurer; Carl Jones, Valdosta, vice-president. Directors are L. R. Taber, Waycross; C. C. Burnet, Valdosta; Rosser Elkins, Waycross; Harold Friedman, Brunswick, and Mr. Miller.

A. J. Moon, Upper Sandusky, has been elected president of the Ohio Northern Chapter of the Ohio Society of Professional Engineers, and Archie V. Hillery, Findlay, secretary.

"They don't come any better."

Says Master Mechanic Ralph Stinson of Missouri Valley Construction Co.



MEN who really know—men, like Ralph Stinson, who have seen General Motors Series 71 Diesels at work—offer proof of their performance: "They hold up better and are easier to maintain than any other Diesel engine in the same horsepower range. They don't come any better," Mr. Stinson says. And he cites his records to back up his statement:

In the summer of 1946, Missouri Valley Construction Co. replaced three 3-ton dump trucks with a pair of Koehring Dumptors, powered by GM 4-71 Diesels. Since then, the two units, now quarrying limestone at Warren, Mont., have tripled production with lower fuel costs. Maintenance has been considerably lower too, Mr. Stinson reports.

General Motors Series 71 Diesel engines are designed to produce more power at lower cost. Their sturdy two-cycle operation delivers power at every piston downstroke—smooth, dependable power that responds instantly to varying load demands. They're sensible in size and weight, and compact construction makes them easy to install. Simplified design makes service and maintenance much easier.

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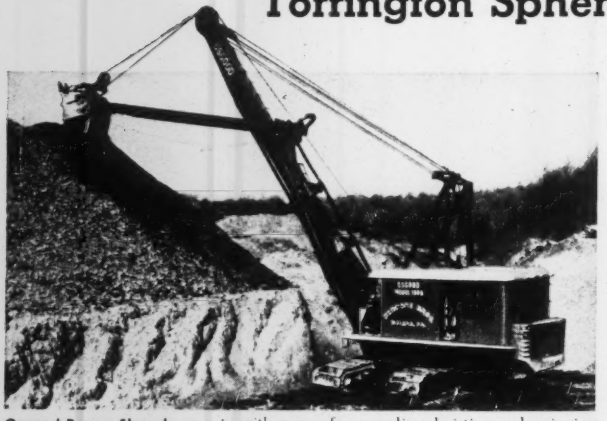
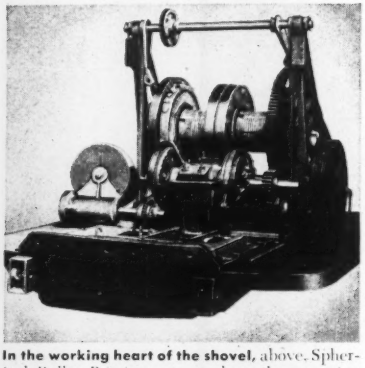
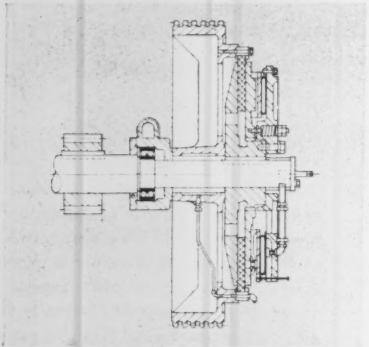
Osgood Power Shovels Crowd, Hoist and Swing Smoothly on Torrington Spherical Roller Bearings



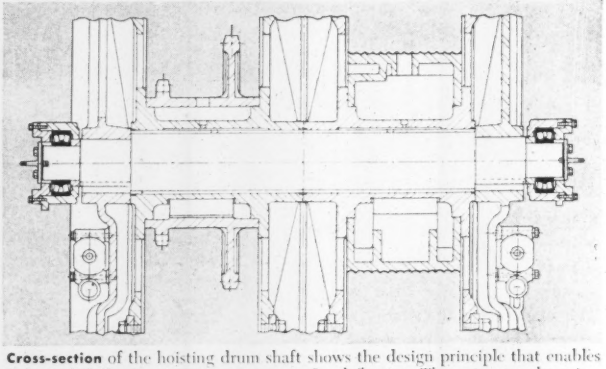
Osgood Power Shovels operate with power for crowding, hoisting and swinging transmitted smoothly on Torrington Spherical Roller Bearings. These self-aligning bearings provide the high capacity required for heavy excavating work and assure long service life. They run free and true even when shock loads cause shaft deflection or frame distortion.



In the working heart of the shovel, above. Spherical Roller Bearings are used on the reversing shaft and the hoisting drum shaft. Design advantages include accurate alignment on installation and axial stability of shafts.

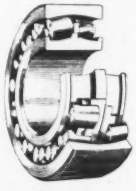


In the reversing shaft installation, shown here, hoisting pinion and bevel gears are held accurately in line, and operate with minimum wear. Spherical Roller Bearings carry the loads with an ample safety factor.



Cross-section of the hoisting drum shaft shows the design principle that enables Spherical Roller Bearings to compensate for deflection. The outer race bore is a section of a sphere, with its center at the axis of the bearing. Barrel-shaped rollers align automatically within this race. Smooth, efficient shovel action results under exacting service conditions.

The reliable performance of Torrington Spherical Roller Bearings in heavy-duty equipment increases machine productivity and reduces maintenance. Our engineers will be glad to help you adapt them to your design requirements. Write us today. The Torrington Company, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities.



TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller

Needle • Ball • Needle Rollers

OBITUARY

Arthur W. French, 80, professor emeritus of civil engineering in Worcester Polytechnic Institute, died at Worcester, Mass., May 27. He had retired in June, 1938, after 39 years of teaching at W.P.I. His educational work was combined with research and consultant engineering. He was a pioneer in reinforced concrete. He was an 1892 graduate of Thayer School of Engineering at Dartmouth College.

Ralph S. Dunlap, 54, of Wilmington, Del., design engineer with E. I. du Pont de Nemours & Co., died on May 27, as he was driving his automobile through Elizabethtown, Pa., on the start of a vacation trip. He was employed by the du Pont Company for the last 13 years.

Herbert C. Schmitt, 58, assistant superintendent of Milwaukee's water purification plant since 1939, died on May 24. Mr. Schmitt started his career at Des Moines, Iowa, and went with the city of Milwaukee in 1919. He was employed as a senior engineer in the city engineering department and began his duties in the water department in 1928, holding positions of engineering draftsman, pitometer engineer and construction engineer in charge of field work for the building of the purification plant.

E. O. Wiggs, 49, former inspector for the Louisville, Ky., district, U. S. Engineers, and a veteran of the first world war, died May 17 at Montgomery, Ala.

Charles R. Goddard, 60, former chief of the construction division of the St. Louis, Mo., district office of the Corps of Engineers, died May 20 at Rahway, N. J. Since 1946 he had been purchasing agent of the White Const. Co., New York.

J. L. E. Price, 60, president of J. L. E. Price & Co., Ltd., Montreal, Que., died May 20. From 1921 to 1931 he was vice-president and director of Geo. A. Fuller Co. of Canada.

Col. Henry J. Lamb, 77, who prior to his retirement in 1941, was supervising engineer for the Canadian Department of Public Works for Ontario for more than 20 years, died at Toronto, May 20.

Everett E. Dammeyer, 45, Indianapolis, Ind., civil engineer since his

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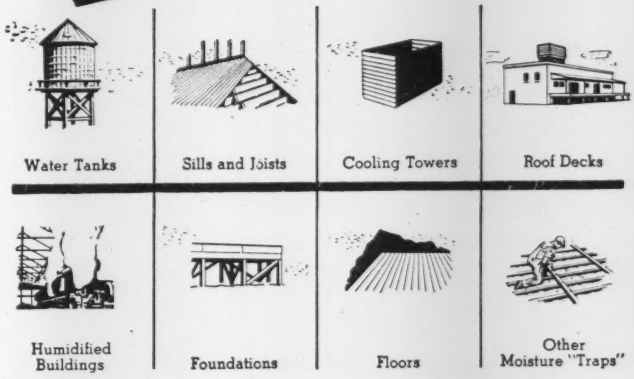

Here are six common conditions where WOLMANIZED Pressure-Treated Lumber provides protection from decay and termites:

1. Where excessive ground moisture, rain or thaws cause early decay failures.
2. Where wood near the ground is open to termite attacks.
3. Where wood is in contact with damp concrete or masonry.
4. Where steam and vapor from industrial processes promote wood decay.
5. Where walls, floors, ceilings are subject to condensation from refrigeration.
6. Where wood is exposed to moisture in artificially humidified buildings.

Investigations by qualified technologists prove that on installations where decay and termites ordinarily shorten lumber life, WOLMANIZED Pressure-Treated Lumber lasts *Three to Five Times Longer* than untreated wood.

Such lasting protection is assured because penetrating, preservative solutions are forced, by vacuum-pressure treatment, deeply into the wood fibers of WOLMANIZED Lumber. And, WOLMANIZED Lumber is clean, odorless, paintable, non-corrosive, non-leaching and glueable. Only WOLMANIZED Lumber offers *all* these extra advantages.

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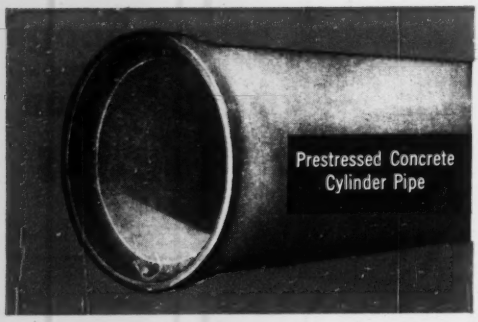

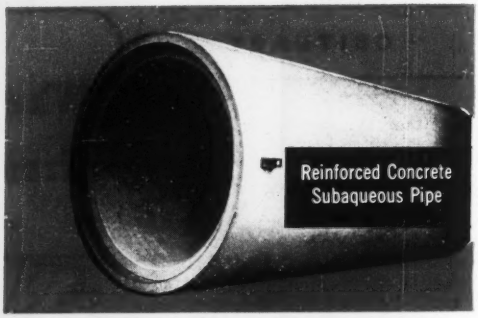

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graduation from Purdue University in 1925, died May 21. He had worked for the Indiana State Highway Commission for 16 years.

Henry E. Wilkinson, 65, Buffalo, N. Y., engineer, died May 18. A graduate of the Massachusetts Institute of Technology, he had joined the city's division of engineering in 1907.

Oscar F. Bellows, 74, who served as designing engineer of the Holland Tunnel for seven years, died at Danielson, Conn., May 20. A C.E. graduate of Brown University, 1896, he was superintendent of construction for the United States Quartermaster Corps at Fort Morgan and Fort Gaines at Mobile, Ala., and at Fort Ontario, Oswego, N. Y. He also was resident engineer for the New York State Barge Canal at Rochester, and engineer for the New York City Board of Water Supply.

Hawaii legislature OK's two big jobs; stops one

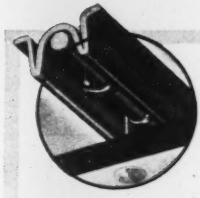
Hawaii's territorial legislature has given the green light to two major public works projects, a tunnel and a pier, and stopped another, a super highway.

It provided for a general obligation bond issue to finance a traffic tunnel to Windward Oahu (a growing suburban area outside Honolulu). The bonds will be repaid from motor fuel tax revenues. This financing was sought after a revenue bond issue approved in 1947 was deemed not feasible. These bonds would have been backed only by tunnel tolls.

The legislative session also beat back a determined bid by private pier owners to stop construction of a new public freight terminal at Pier 2 in Honolulu harbor. The $3,000,000 project now will proceed.

Property owners, making mass protest appearances at the legislative sessions, succeeded in having funds cut off for the proposed arterial highway across the middle of Honolulu. They argued that the inland highway would be both unnecessary and an undue hardship.

Gov. Ingram M. Stainback vetoed a bill submitting the highway construction to a referendum of property owners affected, a measure considered sure to kill the project. The legislators further blocked it by adding a rider to a tax bill providing that no highway revenues should be used for the superhighway construction. Building of a super-highway along Honolulu's waterfront is already under way.



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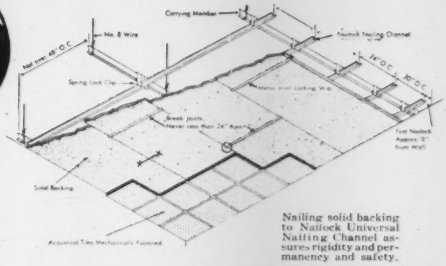

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Permits Use of Any Acoustical Materials Required

Reduce time-wasting grief and time cost on suspended ceiling jobs. Nailock Universal Nailing Channels provide a means for securely fastening backing or backerboard and acoustical tiles in place, and assure a rigid, safe and permanent suspended ceiling installation.

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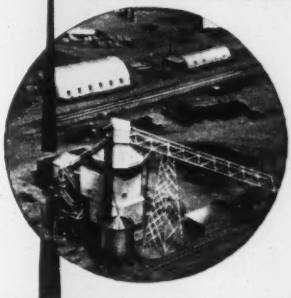

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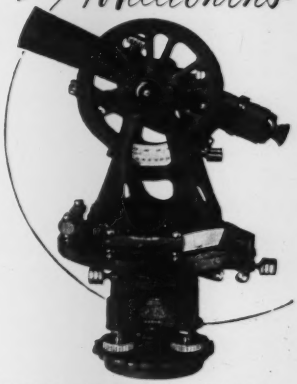

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CONSTRUCTION REPORTS

Proposed Work—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

WATER SUPPLY

●**Ill., Chicago**—City Dpt. P. Wks., City Hall, plans by Alvord, Burdick & Howson, 20 N. Wacker Dr., 1 water filtration plant, foot Grand Ave., **$11,529,000**; water filtration plant, foot Wilson Ave., **$23,571,000**. CD 3/28/45—ENR 4/5/45.

Me., Brewer—Town, Bd. Selectmen, Town Hall, watermains, **$300,000**. Whitman & Howard, 89 Broad St., Boston, Mass., engrs.

●**O., Cleveland**—City, E. Clown, Dir. Pub. Utilities, City Hall, Lakeside and E. 6 Sts., administration bldg., chemical bldg., filter bldg., mixing tanks, settling basin, intake tunnel, West Lake Village, **$6,500,000**. Havens & Emerson, 1140 Leader Bldg., consult. engrs. Frank J. Schwelmler, c/o owner, engr.

●**O., Warren**—City, Joseph Hapgood, water dpt., supt., water treatment plant with mains leading from Mosquito Reservoir; incl. filtration plant, pump station and mains, **$4,300,000**. Havens & Emerson, Leader Bldg., Cleveland, consult. engrs.

Tenn., Morristown—City, erect 133,000 gal. standpipe and exten. distr. sys. **$150,000**. CD 4/18/47—ENR 5/15/47.

SEWERS, WASTE DISPOSAL

Calif., Colton—City, sewage treatment plant activated sludge type **$375,000**. Currie Engr. Co., Anderson Bldg., San Bernardino, consult. engrs.

Calif., Corte Madera—Sanitary Dist. 2 of Marin Co., City Hall, voted **$197,000** bonds sewerage sys. imprv. CD 10/26/48—ENR 11/11/48.

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, 4.48 mi. 8- to 15-in. clay sanitary sewer in Roosevelt Ave., Altadena, **$117,500**. C. E. Arnold, co. engr.

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, 8.83 mi. 8 and 10 in. sanitary sewers in Glendora Ave., **$191,177**. C. E. Arnold, co. engr.

Calif., Santa Barbara—City, City Hall, voted **$750,000** bonds, sewage treatment plant, Koebig & Koebig, Rowan Bldg., Los Angeles, consult. engrs. CD 4/16/46—ENR 4/24/46.

N. C., Spindale—Town, Vernon Proctor, mayor, voted bonds, 4 mi. sanitary sewer lines, **$150,000**. CD 3/24—ENR 4/14.

Okla., Sayre—City, City Hall, voted bonds, sewage disposal plant and sanitary sewer exten. **$350,000**. CD 4/14.

Tenn., Cookeville—City, sewage disposal plant and sewerage sys. **$600,000**.

Tenn., Spring City—City, sanitary sewers, **$250,000**. CD 4/5/46—ENR 4/18/46.

BRIDGES

O., Youngstown—City, City Hall, Boardman and Phelps Sts. bridge, Gibson St. **$150,000**.

Texas and Louisiana—State Hy. Dpt., Austin, Tex., and State Hy. Dpt., Baton Rouge, La., Sabine River Bridge, 5 mi. northeast of Orange, Tex. between Calcasieu Parish, La. and Orange Co., Tex.

STREETS AND ROADS

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, imprv. curbs, gutters, sidewalk, Racine Ave., Paramount, **$85,625**; curbs, gutters, walks, 117 St., Willowbrook, **$73,350**. C. E. Arnold, co. engr.

New York—Dpt. P. Wks., Albany.

Nassau Co.—Nassau Expressway from point on Southern Parkway near Baisley Pond Park southeasterly to north approach to Atlantic Beach Bridge.

Long Beach Expressway from southerly end of Atlantic Beach Bridge through city of Long Beach to end at New York Ave. Andrews & Clark, 305 E. 63 St., New York, Zone 21, consult. engrs. CD 11/11—ENR 11/25.

●**Pennsylvania** — Pennsylvania Turnpike Comm., 11 N. 2 St., Harrisburg.

Dauphin and Lackawanna Counties—exten. Pennsylvania Turnpike from Harrisburg to Scranton, **$100,000,000**.

Mercer and Erie Counties—exten. Pennsylvania Turnpike Western Section from point near Sharon to Erie, **$50,000,000**. R. R. Stone, c/o owner, eng. engr.

●**Tex., Dallas**—Dallas Co., Courthouse, county-wide road construction, imprvs., paving, bridges **$20,000,000**.

●**Tex., Houston**—City, City Hall, 900 Brazos Sts., permanent type paving Main St., Preston to McKinney Sts., N. Main St., from Boundary to Underpass, Main St. from Preston to Underpass, **$1,000,000**; paving 2 blocks Rockwell St. and installing storm sewers, **$100,000**. W. A. Catlin, 2208 Jean St., consult. eng. CD 10/22/44—ENR 12/14/44.

Tex., Houston—Miles Strickland, 2nd Nat. Bank Bldg., constructing and paving streets and parking zone, **$100,000**. Wyatt C. Hedrick, 5201 Fannin St., consult. engr.

Tex., Houston—Bert Wheeler & Assoc., 8380 Main St., street constr. and paving, incl. exten. Buffalo Speedway, south of 9200 block S. Main, **$110,000**.

Tex., LaPorte—City, asph. street paving, street wid'ns, **$100,000**. Wyatt C. Hedrick, 5201 Fannin St., Houston, consult. engr. CD 5/8.

Puerto Rico—Dpt. Interior, San Juan, 1.41 kilometers access road to Bayamon National Cemetery, **$90,000**; 1.77 kilometers Ceiba Municipal Rd., Municipality of Cidra, **$52,000**. CD 9/24/45—ENR 10/4/45.

EARTHWORK, WATERWAYS

Calif., Santa Monica—State Div. Water Resources, dredging 1,000,000 cu. yd. sand in Santa Monica Harbor, **$200,000**.

Ont., Mitchell—Upper Thames River Auth., L. Johnston, Queens Park, London, wid'n., straightening river near here. Approx. **$115,000**.

AIRPORTS AND AIRBASES

●†**R. I., North Kingston**—SHOP— P. Wks. Dpt., Naval Air Station, Quonset Point, 1 and 2 story, 200x525 ft., glass and steel shop overhauling navy plane engines. Naval Air Station **$2,225,000**. Charles A. McGuire & Assoc., 10th Turks Head Bldg., Providence, consult. engrs.

LATIN AMERICA

Argentina, Buenos Aires—Meteror S. A., Buenos Aires, plans plant extens. to mfg sulfuric acid from zinc sulfide concentrates. **$350,000**.

Columbia, Bogota — Shell Oil Co., Bogota, plans pumping stations and other imprvs. **$5,000,000**. CD 6/18/45—ENR 6/21/45.

Mexico—Mexican Govt., D. G. de P., Plaza de la Republica 6, Mexico, D. F., plans 6 multi-family houses each in Chihuahua, Tamaulipas, Baja California, Ciudada Juarez, Nuevo Laredo, Mexicali. **$2,500,000**.

Mexico—Mexican Govt., Sria. de R. H. Balderas, 94, Mexico, plans WW for 2 small towns with aid of Inter American Health and Sanitation Co-operation. **$1,500,000**.

Mexico, Anzaldnas—Mexican Govt., Sria. de Recursos Hidraulicos (Hydraulic Resources Ministry) Balderas 94, Mexico, D. F., plans derivation dam and distr. canal. **$7,500,000**.

Mexico, Mexico, Mexico City—Casa Lux, S. A., Boulevard M. Cernates, Saavedra 92, Mexico, D. F., plans gas stove factory. **$250,000**.

Mexico, Mexico City—Mexican Govt., Sria. de S. y A. P., Mexico, D. F., plans health center. **$300,000**.

Mexico, Mexico City — Monsanto Chemical Co., Zacatecas, 168 c/o E. Uhthoff y Cia., Mexico, D. F., plans synthetic resins and plastics factory. **$300,000**.

Mexico, Mixcoac—Alimentos Infantiles, S. A., Jose Maria Rico, Mixcoac, D. F., plans baby food factory. **$200,000**.

Mexico, Nuevo Laredo — Mexican Federal Govt., c/o Customs Dpt., c/o J. Vidales Marroquin, Nuevo Laredo, apartment, **$300,000** and 100 dwellings. **$100,000**.

Panama, Panama City—Municipality, plans modern abattoir and accommodation for 200 personnel. **$750,000**.

PUBLIC BUILDINGS

●**Ark., Fort Smith**—City, Fort Smith, hospital. **$1,000,000**.

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, plans by J. H. Macdonald, 1913 E. 57 St., three 1 story precast concrete, 13,450 sq. ft. each hospital bldgs., Rancho Los Amigos. **$582,360**. CD 1/16/46—ENR 3/7/46.

●**Calif., Oxnard**—Oxnard Union High School Dist., Oxnard, voted **$1,776,000** bonds, high schools at Camarillo and Fort Hueneme and Oxnard High school addns.

Calif., Rio Vista—Rio Vista Elementary School Dist., Rio Vista, voted **$100,000** bonds, concrete school. Dragon, Schmidts & Hardman, 1320 University Ave., Berkeley, archts. CD 5/2.

●**Calif., Riverside**—Riverside City School Sys., voted bonds elementary school dist. **$1,000,000**; high school **$1,500,000**; college, **$500,000**. CD 1/22/45—ENR 2/8/45.

●**Calif., San Mateo**—San Mateo Co., Courthouse, Redwood City, plans by Douglas D. Stone & Lou R. Mulloy, 619 California St., San Francisco, Community Hospital expansion, **$1,000,000**.

●**Calif., Stockton**—Port of Stockton, Stockton, cotton warehouse, **$1,000,000** and grain elevators and silos **$2,200,000**.

Conn., Groton—Boro., Municipal Electric Power Dpt., 359 Thames St., power plant imprv. **$200,000**.

Conn., Meriden—Meriden Housing Auth., City Hall, plans by W. F. R. Ballard, 123 E. 77 St., New York, N. Y., frame houses, Yale Acres, **$900,000**. CD 3/11—ENR 3/31.

Conn., Milford—Town, John Foran, supt. Schools, Milford, plans by Jesse James Hamblin, 1188 Main St., Bridgeport, 1 and 2 story, 55x280 ft. 13 room, multi-purpose room and kindergarten school, Kay Ave. **$300,000**.

Conn., New Hartford—Town, Bd. Selectmen, Town Hall, plans by Sibley & Nichols, 7 S. Main St., West Hartford, brick, steel school. **$250,000**.

Conn., Newington—Town, Charles Sherwood, chn. Bldg. Comm., 1223 Main St., plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, 2 story, basmt., brick, steel high school, Cedar St., **$900,000**. CD 5/13.

Conn., Shelton—Town, C. B. Taylor, chn. High School Comm., Town Hall, sketches by Brown & Von Beren, Inc., 295 Sherman Ave., New Haven, 2 story, basmt., brick, steel high school addns., alterations. **$250,000**.

Conn., West Hartford—Town, Dr. E. H. Thorne, supt. Schools, Bd. Educ., Hartford, 2 story, basmt., brick, steel school, North End. **$250,000**.

Fla., Chattahoochee — State Bd. Control, Tallahassee, plans by Guy C. Fulton, state archt. Peabody Hall, University of Florida, Gainesville, 200 bed tuberculosis ward extens. to State Hospital. **$650,000**.

Fla., Tampa—Hillsborough Co. Bd. P. Instructions, plans by Norman Six, Hillsboro Hotel Lobby, school. **$250,000**.

●**Ga., Athens**—City, plans by W. J. J. Chase, 1140 Peachtree St., Atlanta, high school. **$1,000,000**. CD 8/6/47—ENR 8/21/47.

Idaho, Blackfoot—Bingham Co., Blackfoot, plans by Paradise and Munter, Dietrick Bldg., Pocatello, 2 story, 44x190 ft. and 1 story, basmt., steel, reinforcem. hospital. **$475,000**. CD 3/2/48—ENR 1/22/48.

Ia., Ames—Independent School Dist., Frank B. Howell, secy., voted **$750,000** bonds, 2 reinforc. brick schools, Tinsley, Higgins & Lichter, 506 Liberty Bldg., Des Moines, archts. CD 4/14—ENR 5/12.

Ia., Nevada—Story Co., Nevada, plans by Wetherell & Harrison, 506 Shops Bldg., Des Moines, 1 story hospital, **$300,000**. CD 11/11—ENR 12/9.

Me., Caribou—Caribou School Dist., D. Surrey, chn., plans by Elliott, Haskell, Barbell & Assoc., 84 Harlow St., Bangor, 1 story, basmt., school, North and Glenn Sts. **$310,000**.

†**Mass., Brockton**—U. S. Eng., Army Base, Boston, veterans hospital, incl. nursery, treatment bldg., theatre, gymnasium, swimming pool etc., Belmont St., Approx. **$250,000**.

Mass., Hyde Park (Sta.), Boston—City of Boston Dpt. School Bldg., 26 Normart St., Boston, school. **$320,000**.

●**Mass., Pittsfield**—City School Dpt., E. J. Russel, supt. Pittsfield, Senior High School. Approx **$250,000**; Junior High School Approx **$250,000**; 2 schools. Approx. **$600,000**. CD 9/20/45—ENR 9/27/45.

●**Mass., Springfield**—City Housing Auth., J. L. Robinson chn., 124 Putnam Circle, 200 to 220 unit veterans housing. **$2,000,000**.

Mass., Westport—Town, Milton Earle, supt. Schools, Westport, plans by J. William Beal Sons, 87 Devonshire St., Boston, 2 story, basmt., brick, steel Junior-Senior High School. $700,000. Stone Underhill Co., 78 Woodvine St., masonry, heating and ventiating engr. CD 8/21/47—ENR 8/14/47.

Minn., Canby—Bd. Educ., Canby, plans by Toltz, King & Day 1509 Pioneer Bldg., St. Paul, high school addn. **$300,000**. CD 4/5746—ENR 6/13/46.

●**Minn., Duluth**—University of Minnesota, R. A. Callaway purch. agt., 323 Administration Bldg., Main Campus, Minneapolis, plans by A. R. Melander, 502 Alworth Bldg., physical education bldg., field house, Duluth Branch of University of Minnesota, **$1,000,000**.

Miss., Jackson—City, City Hall, library, **$500,000**.

Mo., Columbia—Bd. Educ., Columbia, voted **$300,000** bonds, school, West Blvd. Marshall & Brown, 114 W. 10 St., Kansas City, Mo., archt. CD 4/21.

N. J., Benkelman—Bd. Educ., Benkelman, plans by Davis & Wilson, 225 Stuart Bldg., Lincoln, high school. **$300,000**. CD 5/2.

Neb., Hastings — State Bd. Control, Lincoln, plans by Mark Evans, Hastings, administration bldg. at Ingleside State Hospital. **$275,000**.

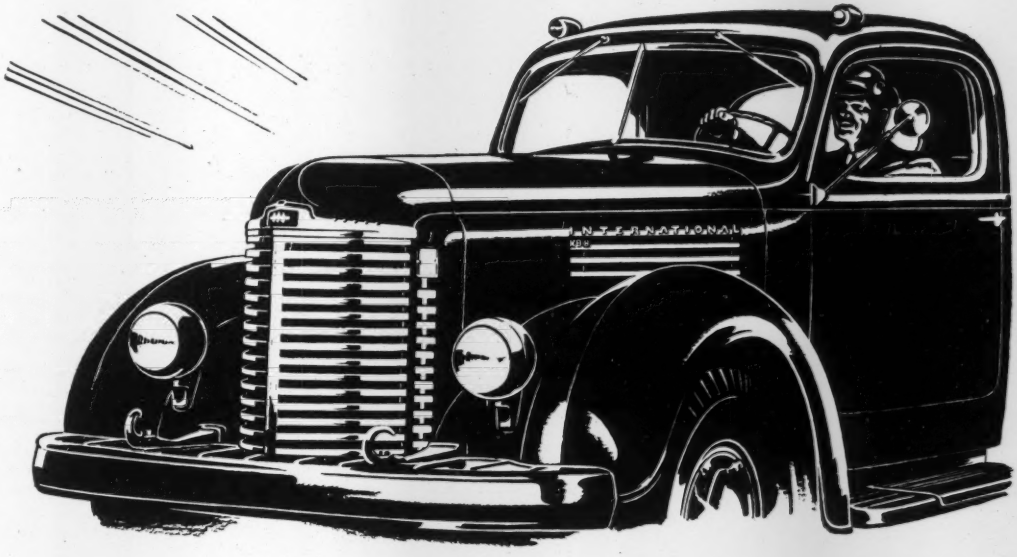
N. H., Walpole—Town School Dpt., Walpole, plans by Irving W. Hersey & Assn., Dover Rd., Durham 2 story 60x200 ft., brick high school and elementary school. **$275,000**. CD 5/2/46—ENR 7/11/46.

†**N. M., Albuquerque**—U. S. Eng., P. O. Box 1558, 2 story 70x600 sq. ft. brick, steel industrial type machine shop, Serial No. 291-49-35. **$500,000**.

●**New York** — Bureau Pub. Wks., Municipal Bldg., New York, Zone 17, plans by York & Sawyer, 101 Park Ave., Zone 17, general hos-

(Continued on page 116)

First in heavy-duty truck sales for 17 straight years!



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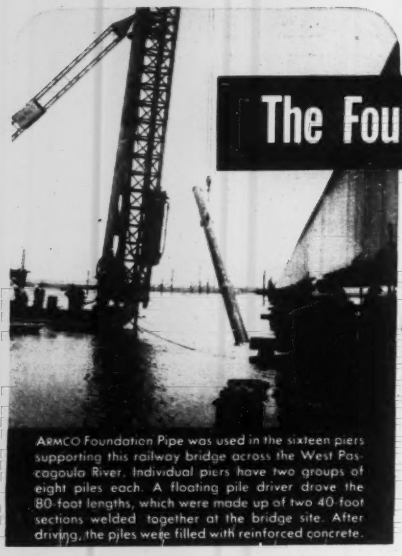

ARMCO Foundation Pipe was used in the sixteen piers supporting this railway bridge across the West Pascagoula River. Individual piers have two groups of eight piles each. A floating pile driver drove the 80-foot lengths, which were made up of two 40-foot sections welded together at the bridge site. After driving, the piles were filled with reinforced concrete.

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ARMCO FOUNDATION PIPE ARMCO

(Continued from page 114)

pital for Dpt. of Hospitals. **$17,200,000.** Fellheimer & Wagner, 155 E. 42 St., Zone 17, consult. engrs. To go ahead in 1951.

●**N. Y., Bayside**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-673, Junior High School 74, vicinity 208 St. and 42 Ave. **$2,325,000.** To go ahead after 1954.

●**N. Y., Brooklyn**—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Sohn & Weston, 44 Court St., Zone 2, Prof. E-68, office bldg. and fire house, Jay St. **$1,060,575.** To go ahead in 1952. CD 1/29/43—ENR 2/4/43.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Raymond Irrera & Kenneth W. Milnes, 2928 41 Ave., Long Island City, Prof. HC-224, staff house for Kings County Hospital for Dpt. Hospitals. **$461,000.** To go ahead in 1950.

●**N. Y., Brooklyn** — Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Bloch & Hesse, 18 E. 41 St., New York, Zone 17, 5 story welfare center bldg., Jay and Johnson Sts. **$1,400,000.**

●**N. Y., Corona**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-645, P. S. 175 vicinity 64 Ave. and 108 St. **$2,000,000.** To go ahead in 1949.

●**N. Y., Flushing**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-675, Junior High School 169, vicinity 190 St. and 58 Ave. **$2,365,000.** To go ahead in 1954.

●**N. Y., Flushing**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-651, Junior High School, 168, vicinity 72 Ave. and 155 St. **$2,300,000.** To go ahead in 1953.

●**N. Y., Jackson Heights**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-321 Junior High School 145, vicinity 72 St. and 32 Ave. **$2,800,000.** To go ahead after 1954.

●**N. Y., Jamaica**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, Junior High School 61, vicinity 180 St. and 84 Ave. E-248. **$2,500,000.** To go ahead in 1953.

●**N. Y., Queens Village**—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, E-80, Junior High School 105, vicinity 208 St. and 90 Ave. **$2,410,000.** To go ahead in 1954.

●**N. C., Raleigh**—State Bd. Public Bldgs. & Grounds, George Cherry, supt., Raleigh, educational bldg., addns., Edenton and Salisbury Sts., **$800,000;** new bldg. for State Bd. of Health **$600,000.**

N. D., Grand Forks — State Bd. Higher Educ., Bismarck, plans by Wells & Dembrook, Northern Hotel, engineering bldg. and women's dormitory bldg. at University of North Dakota. **$500,000.**

N. D., Grand Forks—State Bd. Higher Educ., Bismarck, plans by S. T. DeRemer, 323½ De Mers Ave., mens dormitory at University of North Dakota. **$275,000.**

●**O., Mt. Vernon**—Bd. Educ., Mt. Vernon, bond election Nov. 8, school building program. **$1,030,000.** CD 11/11—ENR 11/25.

O., Oberlin — Bd. Educ., C. E. Wigton, clk., Oberlin, plans by Mellenbrook, Foley & Scott, 26 Front St., Berea, 1 and 2 story, brick school addn. **$550,000.** CD 11/22—ENR 12/23.

Pa., Muncy—Commonwealth of Pennsylvania Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, plans by C. J. Lappley, Front and Harris Sts., Harrisburg, addns., improvs., women's homes, construct industrial bldg. **$275,000.** A. F. Jones, c/o owner, ch. engr. CD 10/17/45—ENR 11/14/45.

Pa., York—Comrs. York Co., Courthouse, plans by Clair S. Buchart, 611 W. Market St., brick, concrete block, steel hospital, **$250,000.**

Pa., York—York Twp. School Bd., c/o C. P. Markley, R. D. 2, York, plans by Clair S. Buhart, 611 W. Market St., school in Village of Spry, York Twp. **$250,000.**

R. I., Warwick—Kent Co. Hospital, A. P. Rucarat, chn. Bd. Trustees, Warwick, plans by Howe, Prout, Ekman, 1016 Turks Head Bldg., Providence, hospital, Toll Gate Rd. **$800,000.**

Tenn., Greeneville—Green Co., Greeneville, plans by Barber & McMurry, 517½ W Church Ave., Knoxville, high school, **$500,000.**

●**Tenn., Memphis** — Shelby Co., Memphis, school, Park St. **$1,100,000.**

Tenn., Nashville — State, Nashville, plans H. Clinton Parrent, Jr., Nashville Trust Bldg., dormitory for negro women at Central State Hospital. **$500,000.**

Tenn., Nashville — State, Nashville, brick, concrete, steel central heating plant for state buildings. **$250,000.**

Tex., Amelia (P. O. Beaumont)—Amelia Independent School Dist., Amelia, voted bonds, school. Approx. **$250,000.**

Tex., Angleton — State Bd. Control, Hal Logan, chn., Austin, heating plant. Retrieve Farm. **$90,000;** Clemens Farm, **$90,000.**

●**Tex., Austin**—City, City Hall, voted bonds May 16, electric power sys. improvs., addns. **$5,650,000.** CD 2/19/48—ENR 2/26/48.

●**Tex., Austin**—University of Texas, Austin, plans by Atlee B. & Robert M. Ayres, Transit Tower, San Antonio, pharmacy **$1,000,000.** Matthews & Kenan, 1305-9 Transit Tower, consult. engrs. CD 5/9.

●**Tex., Baytown** — Goose Creek Independent School Dist., c/o Bd. Trustees, Baytown, plans by Herbert Voelcker & Assoc., 2801 San Jacinto St., Houston, masonry Lee Junior College. **$1,000,000.**

Tex., Big Spring — Howard Co., J. E. Brown judge, Courthouse, plans by Pucket & French, 505 Petroleum Bldg., courthouse. **$600,000.**

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Tex., Canton—Canton Independent School Dist., Canton, voted bonds, school. **$250,000.**

Tex., Corpus Christi—Corpus Christi Independent School Dist., plans by E. E. Hamon, 715 Tancahua St., George Washington Carver School addns., **$250,000**; plans by C. V. Tanner, 3340 Floyd St., addnl. masonry classrooms, Crockett School, **$250,000.** CD 5/13.

Tex., Gatesville — Gatesville Independent School Dist., Gatesville, plans by Wilson & Patterson, Majestic Bldg., Fort Worth, addnl. school. **$520,000.**

Tex., Hempstead—Waller Co. Courthouse, voted bonds, 25 bed county hospital. **$250,000.**

●**Tex., Houston**—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., fire stations, **$1,500,000.** J. M. Nagle, city engr. CD 3/25/43—ENR 4/1/43.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., plans by Theodore F. Keller, M & M Bldg., and Stayton Nunn, 2425 Ralph St., brick, hollow tile, steel, concrete, 1115 Nopal St. Junior High School addns., alterations, **$300,000.** CD 6/23/47—ENR 7/10/47.

Tex., Livingston and Corrigan—Polk Co., Livingston, voted bonds, 30-bed hospital at Livingston and 10 bed hospital at Corrigan, **$325,000.** CD 4/26.

●**Tex., Lubbock**—Texas Technological College, Lubbock, plans by Wyatt C. Hedrick, 1005 First Natl. Bank Bldg., Fort Worth, science, **$325,000**; 2 masonry wings to administration bldg., **$275,000** home economics addn. or new building, **$250,000** 2 wings added to engineering bldg. **$300,000.**

Tex., San Benito—San Benito Independent School Dist., San Benito, masonry, concrete, steel Ed. Downs Ward School. **$250,000.**

Tex., San Marcos—Southwest State Teachers College, San Marcos, plans by Harvey P. Smith, Natl. Bank Commerce Bldg., San Antonio, infirmary, **$250,000**; masonry, steel dining hall, **$375,000.**

●**Utah, Salt Lake City** — Bd. Educ., 440 E. 1st South St., plans by Cannon & Mullen, Templeton Bldg., gymnasium at West High School, **$400,000**; plans by Snedaker & McDonald, Utah Savings & Trust Bldg., gymnasium at East High School **$400,000**; plans by Lowell E. Parrish, Beneficial Life Bldg., Junior High School, **$850,000**; plans by Young & Ehlers, Continental Bank Bldg., school at Parleys Way and 21 East St. **$400,000.** CD 12/15—ENR 1/1.

Utah, Springville—City, Wm. Bringhurst, recdr., voted **$400,000** bonds municipal light and power plant imprvs. L. E. Wiscomb, city engr.

Vt., Manchester—Manchester School Dist., plans by Paysen Rex Webber, 56½ Merchants Row, Rutland, central elementary school and community center, **$450,000.** Cleverdon, Varney, Pike, 120 Tremont St., Boston, Mass., structural engrs. CD 5/29/47—ENR 6/12/47.

W. Va., Parkersburg — City, 717 Ann St., plans by Sansbury & Sons, Julian St., brick, steel Clark Hospital addn. **$850,000.**

Wis., Milwaukee—Bd. Vocational & Adult Education, 1015 N. 6 St., Zone 3, vocational school addn. **$3,000,000.**

Wyo., Cheyenne—School Dist. of Cheyenne, Cheyenne, voted bonds, grade school, South Cheyenne, **$225,000**; addnl. shops at high school, **$75,000**; gymnasium at high school, **$300,000.** CD 4/26.

B. C., Penticton—Penticton Hospital Bd., Penticton, plans by Mercer & Mercer, 615 W. Hastings St., Vancouver, rein.-con. hospital, **$750,000.** CD 9/2—ENR 9/16.

●**Ont., Belleville**—Central Mortgage & Housing, 305 Fleet St. W., Toronto, 1,000 houses, Hasting Co. Home property. Approx. **$5,500,000.** A. J. E. Smith, c/o owner, engr. CD 1/21/48—ENR 2/5/48.

●**Que., Montreal North (Postal Dist. Montreal)**—Municipality, 500 houses, **$3,500,000.**

●**Que., Pointe aux Trembles (Postal Dist. Montreal)**—Municipality, 500 dwellings, **$3,350,000.** CD 11/21/45—ENR 12/27/45.

COMMERCIAL BUILDINGS

Calif., Los Angeles—Midway Hospital Corp., 5925 W. San Vicente Blvd. plans by Arthur E. Harvey, 2455½ S. Western Ave., 2 story, bsmnt., 65 bed 12,000 sq. ft., rein.-con. Midway Hospital. **$250,000.**

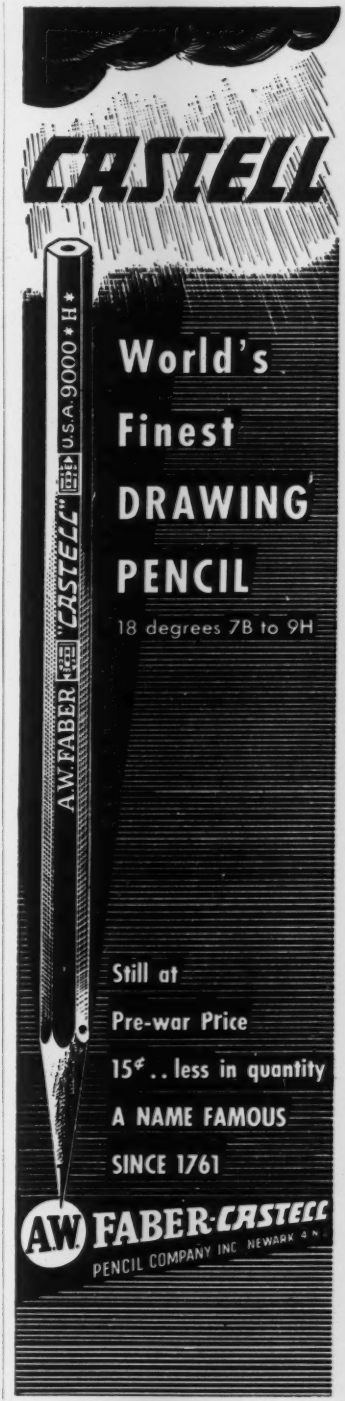
●**Calif., Los Angeles** — Valley Presbyterian Hospital, P. F. Briggs, secy., 1322 N. Vermont Ave., 100 bed hospital, Van Owen and Sepulveda Blvds. Approx. **$1,000,000.**

Calif., Oakland—College of St. Albert the Great, 6172 Chabot Rd., plans by Arnold S. Constable, 955 Spencer Ave., Sausalito, 3 story, rein.-con. House of Studies. **$500,000.**

Calif., San Rafael—R. E. Nolan Co., 408 San Anselmo Ave., San Anselmo, 30 residences in Meadow Glen Tract. Approx. $250,000. F. R. W. Aitken, Jr., 533 Magnolia St., Larkspur, engr.

Calif., Walnut Creek—C. H. Eccleston Co., c/o contractor, Mt. Diablo Community Builders Corp., Putnam and Oak Park Blvd., community shopping center in Pleasant Hill Tract. **$500,000.**

Conn., Bloomfield—Samuel Tyschen, et al, Bloomfield Ave., community center. **$1,000,000-$2,000,000.**



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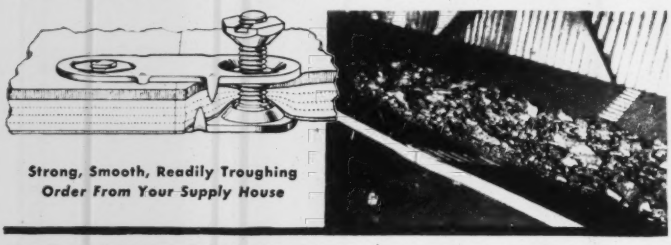

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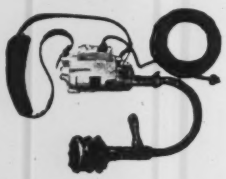

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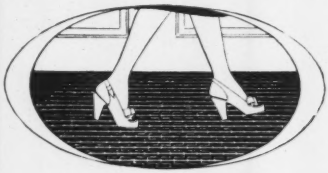

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Conn., New Haven—Security Insurance Co., 175 Whitney Ave., plans by Douglas Orr, 96 Grove St., 3 story, brick, steel office addn., Whitney Ave. **$250,000.**

Conn., Storrs—Southern New England Telephone Co., 227 Church St., New Haven, plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, brick, steel telephone bldg. addn. **$250,000.**

Fla., Coral Gables—Babcock-Lamont Co., c/o Earl V. Wolfe, archt., 3030 Coral Way, Miami, hotel. Approx. **$500,000.**

Fla., St. Petersburg—George Edelstein, 615 4 Ave. N. plans by Philip Kennard, First National Bank Bldg., 9 story apartment. **$500,000.**

Fla., St. Petersburg—Treasure Island Enterprise, Inc., 11000 Gulf Blvd., plans by Ralph Twitchell, Siesta Key, Sarasota, municipal recreational center, Treasure Island Beach, Pinellas Co. **$100,000.**

Ill., Chicago—Chester Moore, c/o Ralph C. Harris, archt., 53 W. Jackson St., 5 story, brick granite office.

●**Ill., Decatur**—Young Mens' Christian Assn., Prairie and Church Sts., 8th story Y.M.C.A. bldg. addn.—alterations. **$1,232,000.** CD 2/28/44—ENR 10/5/44

Ind., Dyer—Sisters of Mercy, Dyer, plans completed by Buchman & Bertram, 511 E. Buchman Ave., Hammond, 4 story, brick, reinforced, steel, stone hospital addns., alterations. **$900,000.**

Ia., Des Moines—Des Moines Golf & Country Club, Walnut Twp., plans by Brooks-Borg, Hubbell Bldg., club house, recreational facilities. **$200,000.**

●**Ia., Des Moines**—Equitable Life Insurance Co. of Iowa, Equitable Bldg., plans by Brooks-Borg, Hubbell Bldg., office. **$1,000,000.**

Ia., Lamoni—Graceland College, Lamoni, plans by Seth and Arthur Temple, 604 Putnam Blvd., Davenport, mens dormitory. **$265,000.**

●**Kan., Hutchinson**—Hutchinson Metropolitan Hotel, Inc., Hutchinson, hotel. **$1,750,000.**

●**Kan., Kansas City**—Hotel Committee, c/o M. L. Breidenthal, Security National Bank, Kansas City, Kan., plans by E. J. Smith, New York Life Bldg., Kansas City, Mo., hotel. **$2,250,000.** CD 8/24/47—ENR 8/28/47.

Kan., Topeka—Elliott Garlinghouse, 824 Quincy St., plans by Culbert & Stuchik, 735 Kansas Ave., office. **$500,000.**

Kan., Wichita—Friends University, Wichita, plans by Thomas & Harris, 125½ N. Topeka St., Economics Bldg. **$250,000.**

Me., Biddeford—Webber Hospital Assn., 350 Elm St., plans by Kendall Taylor & Co., Inc., 221 Columbus Ave., Boston, Mass., brick hospital addns., alterations. **$700,000.**

●**Md., Chevy Chase and Bethesda**—Woodward & Lothrop, 10 and 8 Sts. N.W., Wash., D. C., plans by Starrett & Van Vleck, 267 5 Ave., New York, Zone 16, N. Y., department store, Wisconsin and Western Aves. **$3,000,000.**

●**Mass., Boston**—M. H. Gulesian, 85 Commonwealth Ave., plans by Harry Gulesian, 131 State St., Back Bay Civic and Commercial Development, Back Bay Area, Boylston St., Exeter St., Dalton St. and Huntington Ave., incl. South Concourse—auditorium seating 50,000 persons, etc., North Concourse—multiple parking area 15,000-18,000 car capacity. Approx. **$1,000,000.**

Mass., West Roxbury—St. Theresa Church, Rev. Charles A. Donahue, pastor, 10 St. Theresa Ave., plans by Maginnis & Walsh, 126 Newbury St., Boston, 2 story, basmt. school, St. Theresa Ave. over **$250,000.**

Minn., St. Paul—St. Johns Hospital, H. C. Manke, pres., 396 Mounds Blvd., plans by Ellerbe & Co., E. 505 First National Bank Bldg., hospital addn. **$700,000.**

●**Neb., Omaha**—Byron Reed Co., 5667 Connecticut Ave. N.W., Wash., D. C., 600 unit housing. **$10,000,000.**

●**Neb., Omaha**—Carl C. Wilson, Inc., City Natl. Bank Bldg., housing, 10 and Center Sts. **$1,500,000.**

●**Nev., Las Vegas**—Harry Dotson & Mel Schroeder, Frontier Builders, Las Vegas, residences, North Las Vegas, area bounded by E. owens Ave., E. Tonopah and N. 5 Sts. **$1,000,000.**

●**N. J., New Brunswick**—Rutgers University, The State University, College Ave., 1 story, brick Colonial science bldg., Institute of Microbiology. **$1,250,000.**

N. J., Trenton—Rider College, East State St., plans by Louis S. Kaplan, 25 N. Montgomery St., gymnasium. **$500,000.**

N. Y., Bayside—Pyramid Apartments, Inc., c/o A. Pompa, archt., 31-11 Broadway, Long Island City, 3 story apartment, 201 St. and 43 Ave. **$500,000.**

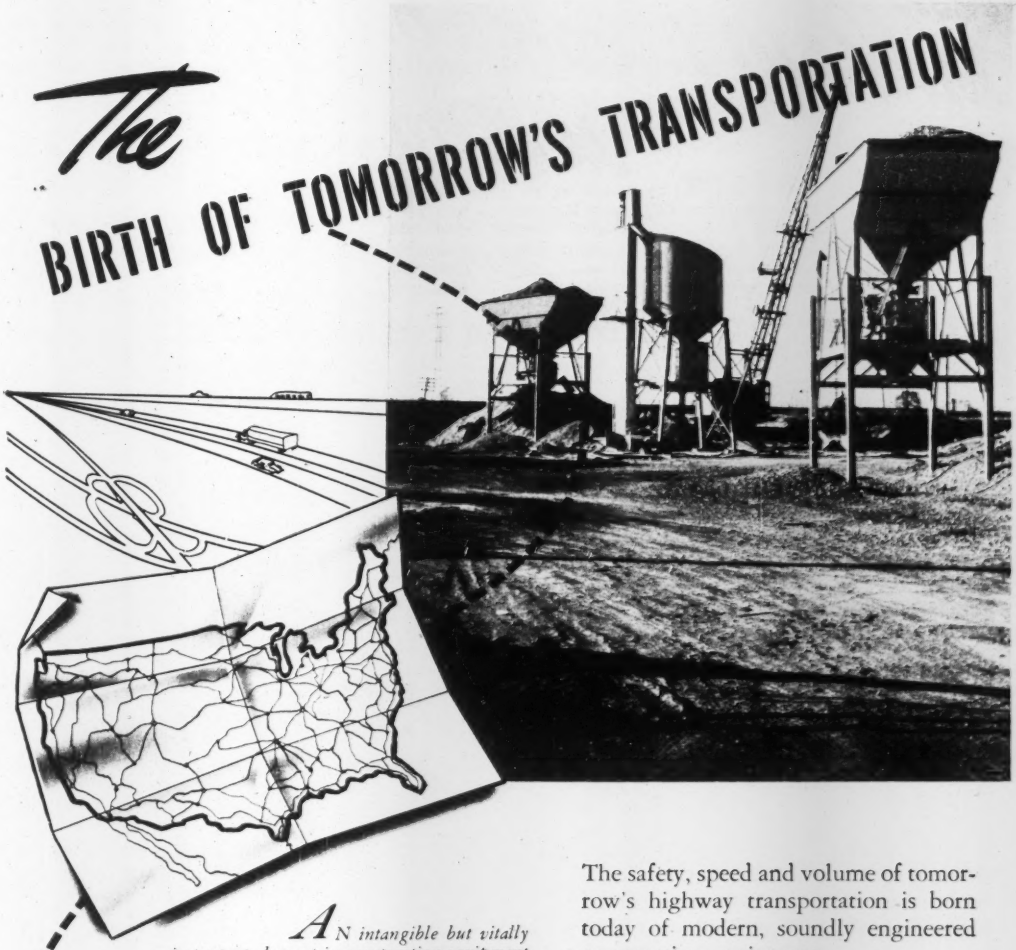
●**N. Y., Bayside**—Wate & Co., c/o Benjamin Braunstein, 163-18 Jamaica Ave., Jamaica, 24 houses, 69 Ave. between 46th Blvd. and 215 St., **$160,000;** 61 houses in area bounded by 69 Ave., 215 St., 73 Ave. and 213 Sts. **$160,000;** 100 houses in area bounded by 69 Ave., 213 St., 73 Ave. and 210 St., **$710,000.**

●**N. Y., Bellaire**—Alley Pond Park Apartments, c/o Arthur Weiner, archt., 29 E. 32 St., New York, Zone 22, apartment in area bounded by Cloverdale Blvd., Kingsbury Ave., 229 St. and 230 St. **$1,299,000.**

N. Y., Brooklyn—Kingsway Development, Inc., 637 E. 93 St., Zone 12, plans by Lamb Proskauer & Prober, 383 Pearl St., Zone 1, two

(Continued on page 121)

The BIRTH OF TOMORROW'S TRANSPORTATION



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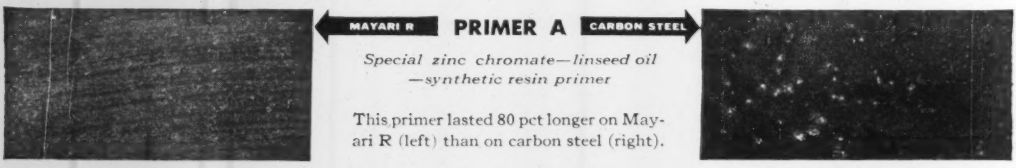
Tests show MAYARI R holds paint 20% to 80% longer

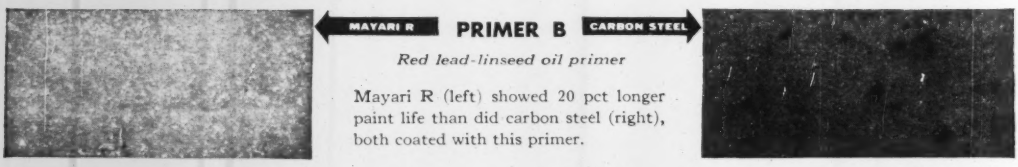
On December 22, 1944 a test was started to determine the relative paint adherence of Mayari R steel and ordinary carbon steel. Five specimens of each of these steels in 4-in. by 4-in. by ¼-in. angle sections with typical partly rusted scale surfaces were wire brushed and given a coating of each of five different types of primer paint at a uniform dry film thickness of 2.5 mils. These painted sections were then placed at a 45-degree angle in a corrosive industrial atmosphere. After exposure under identical conditions for the same period of time, adherence results were as shown below.



PRIMER A

Special zinc chromate—linseed oil —synthetic resin primer

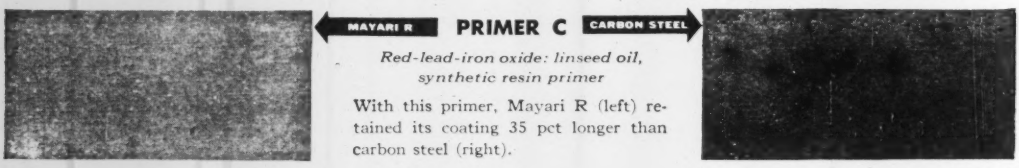
This primer lasted 80 pct longer on Mayari R (left) than on carbon steel (right).



PRIMER B

Red lead-linseed oil primer

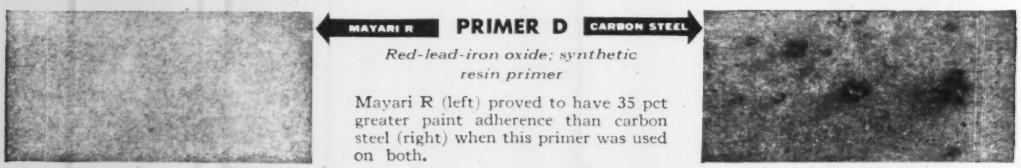
Mayari R (left) showed 20 pct longer paint life than did carbon steel (right), both coated with this primer.



PRIMER C

Red-lead-iron oxide: linseed oil, synthetic resin primer

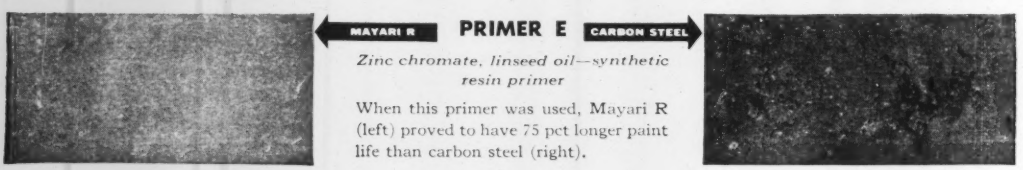
With this primer, Mayari R (left) retained its coating 35 pct longer than carbon steel (right).



PRIMER D

Red-lead-iron oxide; synthetic resin primer

Mayari R (left) proved to have 35 pct greater paint adherence than carbon steel (right) when this primer was used on both.



PRIMER E

Zinc chromate, linseed oil—synthetic resin primer

When this primer was used, Mayari R (left) proved to have 75 pct longer paint life than carbon steel (right).

This research investigation, confirmed by the experience of Mayari R users in many industrial applications, shows how important savings in paint and labor are made possible through the use of Mayari R low-alloy, high-tensile, corrosion-resisting steel.

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(Continued from page 118)

6 story apartments at 9407 and 8507 Kings Hy. **$620,000.**

●**N. Y., Flushing** — Local 3, International Brotherhood of Electric Workers, 130 E. 25 St., New York, Zone 10, 2,000 apartment housing development on 103 acre site, Kissena Blvd., 71 Ave., 164 St. and 65 Ave. **$20,000,000.**

●**N. Y., Forest Hills**—Ritabl Realty Corp., c/o Arthur Weiser, archt., 20 E. 53 St., New York, Zone 22, 149 two story houses in area bounded by Grand Central Parkway, 62 Dr., 110 St. and 64 Ave., **$2,533,000.**

●**N. Y., Kew Gardens**—H. L. Osias, c/o Oscar I. Silverstone, archt., 153 Pierrepont St., Brooklyn, Zone 2, 52 apartments in area bounded by 72 Rd., 147 St. and 75 Rd. and 153 St. **$5,200,000.**

●**N. Y., Kew Gardens**—G. Rosen, c/o Seelig & Finkelstein, archts., 153 Pierrepont St., Brooklyn, Zone 2, apartment, 116 St. near Curzon Pla. **$1,250,000.**

N. Y., New York—Bethune Realty Corp., 332 E. 149 St., Zone 51, plans by I. L. Crausman, 332 E. 149 St., Zone 51, apartment, 572-584 Greenwich St. **$500,000.**

●**N. Y., New York**—Samuel Friedenberg, 20 John St., Zone 5, 21 story office, William and Ann Sts. **$3,000,000.**

N. Y., New York—Guaranty Trust Co. of New York, 140 Broadway, Zone 7, plans by York & Sawyer, 101 Park Ave., Zone 17, bank and office alterations, 140 Broadway, **$300,000.**

●**N. Y., New York**—Veribel Corp., 70 Pine St., Zone 5, plans by Paul Resnick, 654 Madison Ave., Zone 21, 11 story apartment, on block bounded by Henry Hudson Parkway, 256 St., Independence Ave. and 237 St. **$1,200,000.** CD 12-31-46—ENR 1/16/47.

●**N. C., Gastonia**—Gaston Memorial Hospital, R. Grady Rankin, chn. Bd. Trustees, Gastonia, plans by Walter W. Hook & Assoc., 205 W. 4 St., Charlotte, 4 story, bsmt., 60x202 ft., brick, stone, 100-bed hospital, Highland St. **$1,200,000.** CD 12-12-45—ENR 12-20-45.

N. C., Winston-Salem — Ardmore Presbyterian Church, c/o William Roy Wallace, archt., Reynolds Office Bldg., church. **$250,000.**

O., Brecksville—Donald Durlap, Williamson Bldg., Cleveland, plans by Leavitt & Spieth, 1031 Schofield Bldg., Cleveland, 1 story and part 2 story, brick, store, theater and store, Route 82, east of Route 21.

●**O., Cleveland**—Alex Brusino, 17309 Madison Ave., Lakewood, plans by Damon Worley & Assoc., 1365 Ontario St., 200 one story homes, Milton Rd., W. 145 and W. 144 Sts., to W. 146 St., Elsetta, James and Emery Aves. **$2,000,000.**

●**O., Cleveland**—Owner, c/o Charles N. Agree, 1140 Book Bldg., Detroit, Mich., 1 story, 100x300 ft., brick, enamel department store and paving, Lee and Harvard Rds. **$1,000,000.**

O., Cleveland—Louis Kline, 3619 Harvey Rd., Cleveland Heights, plans by Rudolph J. Orgler, 2325 Chester Ave., 24 unit store, 2 doctors offices, 28 bowling alleys, and 1,100 car parking area, W. 150 St. and Puritas Rd. **$750,000.**

O., Cleveland—St. Rocco's Roman Catholic Church, 3205 Fulton Rd., plans by Michael G. Boccia, 505 Osborn Bldg., 2 story, bsmt., 208x85 ft., brick, stone church, Newark and Fulton Rds. **$250,000.** CD 10-18-44—ENR 11-2-44.

O., Cleveland—Western Reserve University, 10940 Euclid Ave., plans by Garfield, Harrison, Robinson & Schafer, 1740 E. 12 St., 3 story, bsmnt., 45x125 ft., brick social science hall, Abbington St. near Cummington St. **$375,000.**

●**O., Columbus**—Harold F. Zieg, 581 E. Town St., plans by Harry T. Roderick, 12 N. 3 St., 6 story, brick, marble, modern apartment, Town St. and Washington Ave. **$1,300,000.**

●**O., Euclid**—Euclid Gardens, Inc., 765 Lake View Ave., plans by Weinberg-Laurie-Teare, 1227 Schofield Bldg., Cleveland, 2 and 3 story, brick, block apartment. **$2,750,000.**

●**O., Garfield Heights**—Z. M. P. Realty Co., Marshall Bldg., Public Square, Cleveland, plans by Damon Worley & Assoc., 926 Engineers Bldg., Cleveland, 1 story, brick, steel 21 unit store, bowling alley and parking area, Turney Rd. and Plymouth Ave. **$1,000,000.**

O., Lakewood—St. Lukes Church, 1212 Bunts Rd., 1 story, bsmnt., brick block church. **$300,000.**

O., Lorain—St. Josephs Hospital, c/o Carl Robinson, Broadway and 21 St., plans by George S. Rider Co., 3500 Terminal Tower Bldg., Cleveland, 3 story, bsmnt., brick, steel 100 bed-hospital addn. **$800,000.** Hospital Consultants, N. Michigan Ave., Chicago, Ill., consult. engrs. CD 6-19-46—ENR 7-4-46.

O., Middleburgh Heights—Anthony Visconsi, Swetland Bldg., Cleveland, plans by Louis Skolnik, 309 Perry Payne Bldg., Cleveland, 1 story, part bsmnt., 140x543 ft. brick, concrete block store about 20 units at Pearl Rd. and W. 130 St. **$500,000.**

●**O., Parma**—Owner, c/o Charles N. Agree, archt., 1140 Book Bldg., Detroit 26, Mich., 1 story, 200x250 ft., brick department store, Brookpart and Pearl Rds. **$1,000,000.**

O., Parma — Pasquariello, 10721 Flower St., Cleveland, 27, 1½ story, brick residences, 2807 and 3117 Hearthstone St. **$283,500.**

O., Parma—Z. & W. Constr. Co., 13484 Cedar Ave., Cleveland, fifty 1½ story, bsmnt., 26x28 ft., frame homes, and garages, 4515 Tuxedo Ave., Grovewood and Brookdale Aves. **$813,000.**

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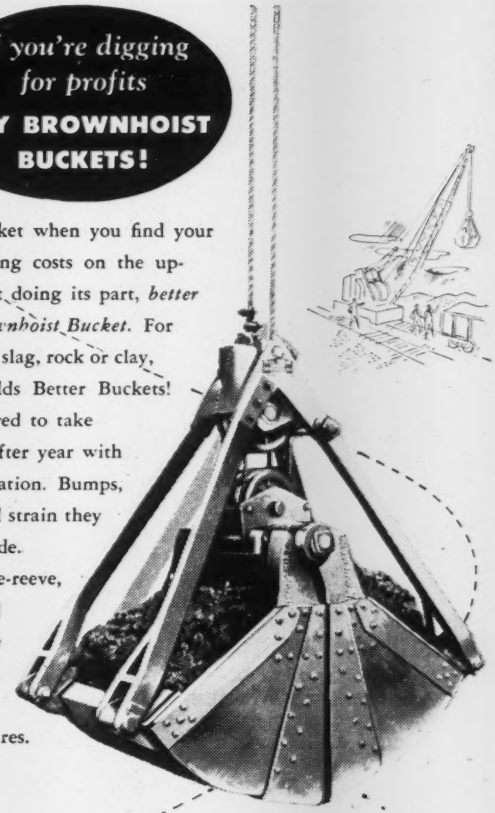

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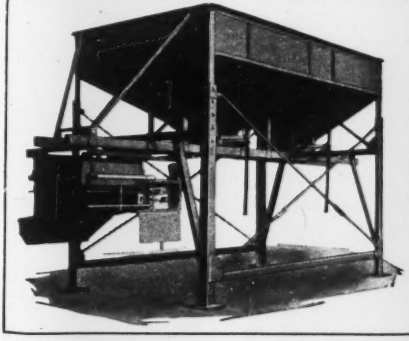

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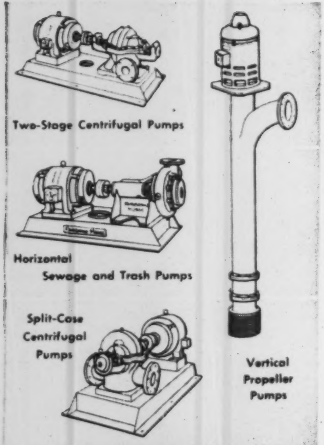

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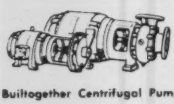
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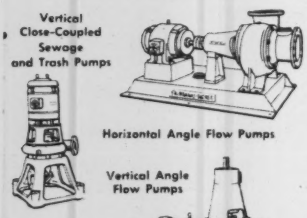
Vertical Close-Coupled Sewage and Trash Pumps
Horizontal Angle Flow Pumps
Vertical Angle Flow Pumps
Vertical Sewage and Trash Pumps
Deep Well Turbine Pumps

O., Shaker Heights—Shaker Moreland Co., National City Bank Bldg., Cleveland, plans by Joseph Weinberg & Wallace G. Teare, Sheffield Bldg., Cleveland, two 2 story, 60x120 ft. shopping bldgs. replacing one bldg. burned, S. Moreland Blvd. and Shaker Blvd. in Shaker Square area. **$400,000.**

O., Youngstown — Young Mens Christian Assn., Walter Bender Chn., Bldg. Com., 40 Main St., N. Y. M. C. A. bldg. forming an "L" with present structure with front on E. Commerce St. **$600,000.**

●**Okla., Oklahoma City**—Commodore Bldg. Co., Hightower Bldg., 18 story apartment hotel, N. W. May and Grand Blvd. **$2,000,000.** R. B. Friess, Hightower Bldg., consult. engr.

●**Okla., Oklahoma City**—Stamford Homes, Inc., 1405 S. W. 29 St., 660 unit housing, S. W. 44 and Blackwelder Ave. **$2,500,000.** Harry Becker, Courthouse, consult. engr.

Okla., Oklahoma City—Ben Wileman, Petroleum Bldg., 150 unit housing N. W. 16 and Portland Sts. **$600,000.**

Okla., Tulsa—W. C. Lane, 2439 E. 1 St., 50 unit housing, 77 and Sheridan Rd. **$400,000.**

●**Okla., Tulsa**—Otis Nidiffer Bldg., 1930 S. Riverville St., plans by Wm. Wolaver, 1423 South Boston St., 400 frame houses, 51 and Peoria Sts. **$2,500,000.**

Pa., Bethlehem—W. K. Dodson Co., 3308 14 St. N. W. Wash., D. C., 2 story, brick apartment **$500,000.** L. M. Fraivillig, Bethlehem, consult. engr.

Pa., Brackenridge — Pacific Manor, Inc., Saxonburg Rd., Tarentum, plans by Phillip Friedman, 121 S. Negley Ave., Pittsburgh, two 3 story, basmt., 43x132 ft., brick, block apartments **$518,000.**

Pa., Charleroi—Maple View Apartments, Inc., 408 Fallowfield Ave., plans by Phillip Friedman, 121 S. Negley St., Pittsburgh, three 3 story, basmts., 43x132 ft. brick, tile apartments. **$380,000.**

Pa., Greensburg—John Mullin & Cavalier, 480 Shearer Ave., Greensburg, plans by Phillip Friedman, 121 S. Negley Ave., Pittsburgh, 3 story, basmt., brick, steel frame apartment. **$250,000.**

Pa., Upland—J. Lewis Crozer Hospital, Upland, plans by George Wharton Pepper Jr., Lewis Tower Bldg., Phila., hospital addn. **$300,000.**

R. I., Providence—Manning Gardens, Inc., c/o George J. Cavalieri, archt., 384 E. 149 St., New York, N. Y., 2 story, irregular U-shaped brick, concrete garden apartments, Gano and E. Manning Sts. **$300,000.** Charles J. Riley, 122 Bradeham St., consult. engr.

Tenn., Knoxville—Knoxville Catholic High School, c/o Baumann & Baumann, archts., 813½ Market St., high school. **$250,000.**

Tex., Austin—Episcopal Diocesan School c/o Reed, Wm. Brewster, Austin, school, 400 acre site on Lake Austin. **$325,000.**

Tex., Bryan—Allen Academy, Bryan, plans by Norton & Mayfield, P. O. Box 1169, brick, steel, concrete auditorium and classrooms. **$350,000**; 2 story masonry dormitory. **$250,000.**

●**Tex., Dallas**—Southwestern Legal Center, Republic Nat. Bldg., main bldg. as research center. **$550,000**; masonry, steel, concrete lawyers dormitory. **$150,000**, on 5 acre tract donated by Southern Methodist University.

Tex., Dallas—Ursuline Academy, 1330 St. Joseph St., high school, 28½ acre tract Walnut Hill. **$100,000**; dormitory and dining for boarding school, Walnut Hill. **$250,000.**

Tex., Houston—David O. Roemer, Radnay Rd. 10 high class masonry dwellings. **$375,000.**

●**Tex., Houston**—Miles Strickland, 2nd Natl. Bank Bldg., plans by Duncan & Jones, 4919 Montrose Blvd., masonry, concrete, steel type shopping center. **$10,000,000.**

●**Tex., Houston**—Southerest, Inc., Union Natl. Bank Bldg., 240 dwellings, Griggs and Mykawa Rds. **$2,500,000.**

Tex., Houston—Woodridge Baptist Church, 4511 Kyle St., plans by Jackson & Toll, 4511 Kyle St., church chapel and 2 story educational wing, Wingler Dr. at Woodridge. **$200,000.**

Tex., Lufkin—First Baptist Congregation, Dr. Bradford, pastor, Lufkin, plans by Gregory & Cates, 207 W. Erwin St., 3 story, 78x120 ft., brick, steel educational bldg., concrete slab fdn., winter and summer air-conditioning. **$250,000.**

Tex., Nederland — Wilkins & Hawthorne, Nederland, 60 frame dwellings, west of old Beaumont Hy. **$375,000.**

Tex., San Antonio—J. K. Stark, 3500 San Pedro Ave., 40 residences, concrete fdn., Irvington and Devonshire off Austin Hy. **$280,000.**

Tex., San Antonio—E. C. Whiteside, 3825 Grammercy St., Houston, 14 dwelling, Bumbarron Rd. **$28,000.**

Vt., Winooski (Ind. Br. Burlington)—St. Michael's College, Rev. D. P. Lyons, pres., Winooski Park, plans by Freeman, French, Freeman, 138 Church St., Burlington, 3 story, basmt. dormitory, at Winooski Park. **$300,000.**

Wash., Puyallup—Lutheran Minor Chronic Disease Hospital, Puyallup, plans by Heath, Grove & Bell, Puget Sound Bank Bldg., Tacoma, hospital. **$425,700.** CD 2-10—ENR 3-3.

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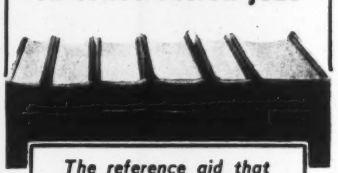

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plans by Rule, Wynn & Rule, 300 Birks Bldg., Edmonton, 75x120 ft. office. Approx. **$500,000.**

●**Que., Quebec City**—J. Gosselin & Assoc., Elevator Bldg., plans by W. Lacroix, 132 St. Peter St., 11 story bsmnt., rein.-con., steel brick, stone hotel, **$2,000,000.**

INDUSTRIAL BUILDINGS

Conn., Glastonbury — WAREHOUSE — Consolidated Tobacco Corp., 651 Windsor St., Hartford, plans by Mylchreest & Reynolds, 238 Palm St., Hartford, 1 story, cinder block, brick tobacco warehouse, Oak St. **$100,000.**

●**Fla., Greenville**—GENERATING PLANT, etc.—Seminole Electric Co-operative, Greenville, oil-fueled electric generating plant and connecting transmission lines to supply electric current to 7 regular co-operatives which make up the Super Seminole Co-operative, **$18,000,000.** C. P. McLean, Moultrie, consult. engr.

Fla., Miami — WAREHOUSE, etc. — John Woodrum, c/o M. M. Ungaro, archt., 814 Olympia Bldg., warehouse and store, **$550,000.**

Fla., Tampa — LAUNDRY — National Linen Co., 445 Highland Ave., N.E., Atlanta, Ga., plans by J. B. Jackson, Ashville, N. C., laundry and equip. **$100,000.**

Ill., Chicago — FACTORY — Frigid Fluid Co., 2431 W. VanBuren St., plans by Fox & Fox, 30 N. LaSalle St., steel, brick factory, **$250,000.**

Ill., Lockport—GRAIN ELEVATOR—Cargill, Inc., 135 S. LaSalle St., Chicago, grain elevator, **$100,000.**

●**Ia., Council Bluffs**—POWER PLANT—Iowa Power & Light Co., 312 6 St., Des Moines, power plant, **$5,000,000.**

Ia., Oskaloosa—FACTORY—Ideal Mfg. Co., Oskaloosa, plans by William Nielsen, Hubbell Bldg., Des Moines, factory, **$100,000.**

Kan., Lawrence — PLANT — Kansas Color Press Co., Lawrence, plant, **$750,000.**

●**N. Y., Brooklyn** — GENERATING STATION — Consolidated Edison Co. of New York, Inc., 4 Irving Pl., New York, Zone 3, 4 story electric generating station, 196 John St., **$2,500,000.** Theron R. Galloway, c/o owner, engr.

N. Y., Brooklyn — FACTORY, etc.—Frankmort Realty Corp., 40 Worth St., New York, Zone 13, plans by Charles M. Spindler, 184 Montague St., Zone 2, 1 story factory and warehouse, 5410 Avenue U. **$100,000.**

N. Y., Brooklyn — FACTORY — Prince St. Holding Corp., 161 Willoughby St., Zone 1, plans by Abraham Farber, 66 Court St., Zone 2, 3 story factory, 147-57 Prince St. **$175,000.**

●**O., Cleveland** — PARKING GARAGE — Owner c/o A. G. Breckling, c/o Breckling Coal & Supply Co., 631 Stones Levee, 8 story parking garage, **$2,500,000.**

O., Crestline—FACTORY—Schill Mfg. Co., E. V. Remy, genl. mgr., factory.

O., Defiance—SERVICE and GARAGE—Toledo Edison Co., Edison Bldg., Toledo, plans by Phillip T. Sherman, Defiance, 1 story service bldg. and garage, **$100,000.** W. H. Schwallbert, Defiance Div. Defiance, company, engr.

O., Geneva — PLANT — Geneva Free Press, R. B. and Donald C. Rowley, Ashtabula, newspaper plant, **$100,000.**

●**O., Toledo** — FREIGHT TERMINAL — Baltimore & Ohio R. R., H. H. Harsh, engr. Maintenance and Ways, (Central Region), Smithfield and Water Sts., Pittsburgh, Pa., freight terminal for general merchandise near east end of Fassett St. bridge, incl. storage facilities, office space and trackage. **$1,000,000.**

●**O., Toledo** — MARINE TERMINAL — Sun Oil Co., Woodville and City Limits, marine terminal 45 acre river front tract in East Toledo, **$1,000,000.**

Pa., Upper Darby—GARAGE, etc.—Phila. & Western R. R. Co., Main and Swede Sts., Norristown, plans by Simon & Boulware, Fidelity-Phila. Trust Bldg., Phila., garage, office and service, **$500,000.**

●**S. C., North Charleston**—PLANT—West Virginia Pulp & Paper Co., North Charleston, plant addn., incl. facilities, chemical recovery unit, **$1,110,000;** lime kiln **$450,000;** turbine and boiler **$1,300,000** each, and barking drum, **$250,000.** CD 7-11-45—ENR 7/26/45.

S. C., Saluda — PLANT—Palmetto Full Fashion Hosiery Mill, Saluda, hosiery plant addn. **$100,000.**

●**Tex., Belton** — GENERATING UNITS, etc. — Brazos River Transmission Electric Co-operative, Waco, two 11,500 kw. steam generating units in Oak Charter Plant, near here, 211 mi. transmission lines, new sub-station and general plant improv., Bell Co. **$6,480,000.** CD 1-16-47—ENR 1-30-47.

Tex., Dallas — SHOP — Beard & Stone Electric Co., Inc., 2101 Bryan St., masonry electric shop, Live Oak St. Approx **$100,000.**

●**Tex., Dallas** — PLANT — Dallas Power & Light Co., Dallas Power & Light Bldg., 60,000 kw. turbine-generator electric power unit, to be known as Parkstale Power Plant, on the East Side, **$3,000,000.** CD 2/3—ENR 2/17.

●**Tex., Houston** — PLANT, etc. — Houston Lighting & Power Co., 1016 Walker St., West Junction Station plant expan. Approx. **$1,000,000,** turbine generator unit and appurtenances, Approx. **$1,000,000.**

Tex., Houston — WAREHOUSE — Humble Oil & Refining Co., Humble Bldg., reconstructing warehouse, Race and Rains Sts. **$100,000.**

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●**Tex., Houston**—STORAGE—Joe Shiver & Assoc., Angleton, plans by Edward Palmer Cotter, 1811 Southgate St., 2 and 5 story, 60x140 ft., rein.-con. steel document storage, 2500 block Navigation Blvd. **$1,000,000.**

Wis., Starks — WAREHOUSE — Starks Farms, Starks, 1 story, 60x200 ft., concrete warehouse, Genisot Eng. Co., 1512 N. Eagle St., Rhinelander, consult. engr.

●**B. C., Trail** — LEAD SMELTER — Consolidated Mining & Smelting Co. Ltd., Trail, lead smelter, **$12,000,000.** CD 5/20/48—ENR 6/6/48.

●**Man., Sherridon** — POWER PLANT — Sherritt Gordon Mines Ltd., 5 King St., Toronto, Ont., power plant. **$17,500,000.** CD 4/7/47—ENR 4/17/47.

Ont., Alliston—STORAGE and SHIPPING—Co-operative of Ontario, 28 Duke St. and Dpt. Agriculture, Queens Park, Toronto, potato storage and shipping center. Approx. **$500,000.**

Ont., Leamington—STORAGE and SHIPPING—Co-operative, of Ontario, 28 Duke St. and Dpt. Agriculture, Queens Park, Toronto, potato storage and shipping center. Approx. **$500,000.**

Ont., Mimico—STORAGE and SHIPPING—Co-operative of Ontario, 28 Duke St. and Dpt. Agriculture, Queens Park, Toronto, potato storage and shipping center, near Lake Shore Rd. Approx. **$500,000.**

Ont., Shelbourne—STORAGE and SHIPPING—Co-operative of Ontario, 28 Duke St. and Dpt. Agriculture, Queens Park, Toronto, potato storage and shipping center, Caledon area. Approx. **$500,000.**

●**Ont., Toronto**—PLANT—Canadian S. K. F. Co., Ltd., 1957 Bay St., plant, Scarborough, **$1,000,000.** T. Pringle & Son Ltd., 485 McGill St., Montreal, Que., engr. CD 5/2—ENR 5/19.

●**Que., Montreal**—WAREHOUSE—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., warehouse bldgs. **$2,465,000.** CD 1/22/48—ENR 1/22/48.

Que., Val d'or—CONCENTRATOR—Dulama Gold Mines Ltd., 330 Bay St., Toronto, Ont., 200 ton concentrator. **$125,000.** CD 4/18—ENR 5/5.

UNCLASSIFIED

Calif., Palm Springs — PARKS, etc. — City, Palm Springs, voted **$950,000** bonds, parks, fire protection facilities, sidewalks and streets, street lighting, rest rooms. CD 4/1.

Colorado — RURAL DISTRIBUTION LINES —Mountain View Electric Assn., Limon, 91 mi. rural distr. lines, hearquarters facilities, two-way radio sys., and completing previously approved constr. **$192,000.** Fiora Eng. Co., 1717 E. Colfax Ave., Denver, consult. engr.

Fla., Jacksonville — TELEVISION FACILITIES—City, television facilities, in connection with Municipal Radio Station "WJAX" already in operation. Approx. **$150,000.**

Fla., St. Petersburg — MOTOR COURT — James E. Woodhouse, c/o W. O. Sparklin, archt., 605 W. Lafayette St., Tampa, motor court, approx. **$100,000.**

Georgia—RURAL DISTRIBUTION LINES—Canoochee Electric Membership Corp., Reidsville, 40 mi. rural distr. lines, sys. imprvs., 3 mi. tie lines and two-way radio communication, Tattnall Co., **$130,000.**

Georgia—RURAL DISTRIBUTION LINES—Cobb County Rural Electric Membership Corp., Marietta, 50 mi. rural distr. line, sys. imprvs., and completed constr. with prior REA approval, Cobb Co. **$245,000.** CD 8/23—ENR 8/28.

Georgia—RURAL DISTRIBUTION LINES—Snapping Shoals Electric Membership Corp., Covington, 25 mi. rural distr. lines, sys. imprvs., and completed constr. with prior REA approval, Newton Co. **$150,000.**

Georgia—RURAL DISTRIBUTION LINES—Troup County Electric Membership Corp., La Grange, 253.9 mi. rural distr. lines, Troup Co. **$253,000.** J. R. McCrary Eng. Corp., 22 Marietta St. Bldg., Atlanta, Zone 3, engrs. CD 1/3/47—ENR 1/23/47.

Ill., Taylorville — DRIVE-IN THEATRE — Frisina Amusement Co., Dominic Frisina, pres., c/o Roxy Theatre, Springfield, drive-in theatre, on farm between here and Sharpsburg, **$100,000.**

Ia., Waterloo — SWIMMING POOL, etc. — Sunnyside Country Club, Waterloo, swimming pool, walks, drives, recreation bldg. **$103,000.**

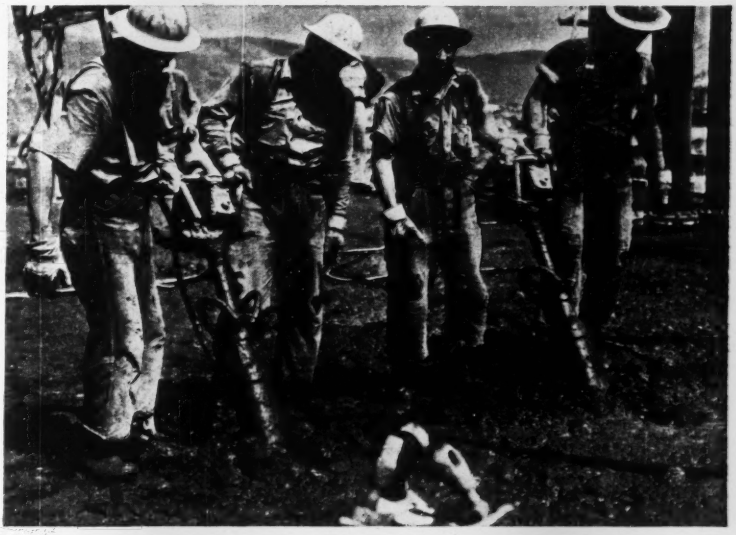
Ind., Jeffersonville—DRIVE-IN THEATRE—Municipal Enterprises, F. J. Isler, pres., Indianapolis, and Robert U. Rodorff, Jeffersonville, drive-in theatre, U. S. Hy. 31-E, incl. roadway parallel to U. S. 31-E. **$100,000.**

Kansas—RURAL DISTRIBUTION LINES—Co-operative Power & Light Co., Iola, 180 mi. rural distr. lines, sys. imprvs., new 161 kv line and completing previously approved construction in Allen, Neosho, Anderson, Woodson, Wilson and Bourbon Counties. **$192,000.** Frank Horton & Co., Lamar, Mo., consult. engrs.

Kansas—RURAL DISTRIBUTION LINES—Victory Electric Cooperative Assn., Dodge City, 558 mi. rural distr. lines, sys. imprvs., 15 mi. tie line, 2-way radio communication sys., Ford Co. **$196,000.** Frank Horton & Co., Lamar, Mo., engrs. CD 4/13—ENR 4/28.

Kentucky—GAS PIPE LINE—Tennessee Gas Transmission Co., Commerce Bldg., Houston, 26 in. natural gas pipeline, in and across bed of Kentucky River, approx. 2.5 mi. east of Jackson Ferry, Madison and Clark Counties, and 187 mi. above mouth of river.

(Continued on page 126)



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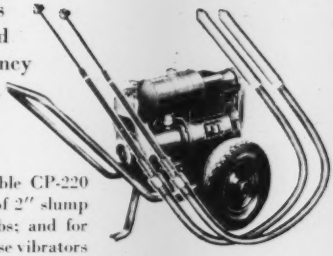

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(Continued from page 124)

La., Lake Charles — ARENA — State, Bd. Liquidation, Lake Charles, remodeling, impv. McNeese Arena, **$150,000.**

La., New Orleans — RADIO-TELEPHONE STATION—Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, Tex., and Southern Bell Telephone & Telegraph Co., Inc., 51 Ivy St. N. E., Atlanta, Ga., maritime radio-telephone station, incl. transmitter and receiver units. **$100,000.**

Minnesota—RURAL DISTRIBUTION LINES—Dairyland Electric Co-operative, Grand Rapids, 109 mi. rural distr. lines, sss. imprvs., 7 mi. transmission lines, headquarters facilities, South Itasca Co. **$130,000.**

Missouri — RURAL DISTRIBUTION LINES—Barry Electric Co-operative, Cassville, Mo., rural distr. lines, tie lines, headquarters facilities, two-radio, Barry Co. **$190,000.** Frank Horton & Co., Lamar, engrs. CD 3/29—ENR 4/7.

Missouri—RURAL DISTRIBUTION LINES—Black River Electric Co-operative, Ironton, 131.72 mi. rural distr. lines, sss. **$135,000.** Frank Horton & Co., Lamar, Mo., consult. engrs. CD 2/28

Missouri—RURAL DISTRIBUTION LINES—New-Mac Electric Co-operative, Neosho, addtl. rural distr. lines, sss. imprvs., Newton, Jasper, Lawrence and McDonald Counties, **$659,000.**

Missouri—RURAL DISTRIBUTION LINES — Platte-Clay Electric Co-operative, Inc., Platte City, addtl. rural distr. lines, sss. extens. and imprvs., Platte Co. and vicinity **$315,000.** Frank Horton & Co., Lamar, engrs. CD 2/3—ENR 2/19.

Mo., St. Joseph — DRIVE-IN THEATRE — Durwood Theatres, Inc., Walkheim Bldg., Kansas City, plans by S. W. Bihr, 3706 Broadway, Kansas City, drive-in theatre, **$100,000.**

Montana — RURAL DISTRIBUTION LINES—Elmo Electric Co-operative Assn., Polson, 48 mi. rural distr. lines, Elmo Co., **$110,000.**

Montana—RURAL DISTRIBUTION LINES—Yellowstone Valley Electric Co-operative, Huntley, 85 mi. rural distr. lines, 3 mi. 50 kv transmission lines, sss. imprvs., Yellowstone Co. **$240,000.**

●**Nebraska**—RURAL DISTRIBUTION LINES—Custer Public Power Dist., Broken Bow, rural distr. lines, Custer Co. **$1,900,000.** Raymond H. Reed & Co., Columbus, consult. engrs. CD 1/22/48—ENR 2/5/48.

Nebraska—RURAL DISTRIBUTION LINES—McCook Rural Public Power Dist., McCook, rural distr. lines, McCook Co. **$765,000.** P. L. Burns, 620 Davenport Bank Bldg., Davenport, Ia., consult. engr.

†N. M., Alamogordo — UTILITIES — U. S. Engr., Box 1538, Albuquerque, outside utilities sss., incl. constructing and paving roads and streets, sanitary sewer, waterlines, facilities, electric distr. sys. and gas lines, Serial No. Eng-29-005-49-98. **$150,000.**

North Carolina—RURAL DISTRIBUTION LINES—Cornelius Electric Membership Corp., Cornelius, 122 mi. rural distr. lines, sss. imprvs., 14 mi. new tie lines, Mecklenburg Co. **$215,000.**

●**North Carolina**—Rutherford Electric Membership Corp., Forest City, 615 mi. rural distr. lines, sss. imprvs., 12 mi. new tie lines, Rutherford Co. **$1,108,000.**

Ohio—RURAL DISTRIBUTION LINES—Guernsey-Muskingum Electric Co-operative, New Concord, 80 mi. rural distr. lines, sss. imprvs., 35 mi. new tie lines, Guernsey Co. **$285,000.** CD 1/29—ENR 2/5.

O., Perrysburg — SWIMMING POOL, etc. — Village Council, plans by Ackley, Bradley & Day, Sewickley, 50x150 ft. adult swimming pool and 25x25 children's pool, Elm St. and Silvermaple Dr. **$125,000.** CD 11/14—ENR 11/25.

Pa., Easton—DRIVE-IN OUTDOOR THEATER—Easton Amusement & Theatre Co., Easton, plans by Wm. W. Carlton & Assoc., 15 E. 5 St., Cincinnati, O., concrete block drive-in outdoor theatre. **$150,000.**

●**Pa., Harrisburg**—YARDS—Reading Co., E. L. Gosnell, ch. engr., Reading Terminal, Phila., impvs., modernizing Rutherford Yards, incl. relocation tracks, installing retarders and other impvs. **$5,000,000.**

Pa., Phila.—PIERS—Pub. Wks. Office, Phila. Naval Base, repairing Piers A, B and C at Naval Ship Yard, NOY 18623. **$291,000.**

●**Pa., Pittsburgh** — PARK, etc. — Pittsburgh Parkway Auth. and City, City County Bldg., plans by Mitchell & Ritchey, 5244 Ave., reinforced, underground facilities for 1,000 cars on 5 floor level. **$4,500,000.**

South Carolina—RURAL DISTRIBUTION LINES — Palmetto Electric Co-operative Bedgland, 245 mi. rural distr. lines, sss. imprvs., completing previously approved constr. and completing construction with prior REA approval, Hampton Co. **$160,000.**

South Dakota and Nebraska—RURAL DISTRIBUTION LINES—Cherry-Todd Electric Co-operative, Mission, S. D., 491 mi. rural distr. lines, 26 mi. transmission line, Mellette and Todd Counties, S. D. and Cherry Co., Neb. **$810,000.** D. O. Elahart, Rapid City, S. D., consult. engr.

●**South Dakota** — RURAL DISTRIBUTION LINES—Intercounty Electric Assn., Mitchell, completing previously approved construction, 25 mi., 33 kv rural distr. lines, headquarters, and 695 mi. rural distr. lines, Hanson, Davison, Sanborn and Miner Counties. **$1,185,000.** Buell

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& Winter, Insurance Exchange Bldg., Sioux City, Ia., consult. engrs. CD 11/12/45—ENR 12/13/45.

South Dakota — RURAL DISTRIBUTION LINES—Ree Electric Assn., Miller, 573.3 mi. rural distr. lines. Hand Co. **$575,000.** Bannister Eng. Co., 1549 University Ave., St. Paul, Minn., consult. engr.

South Dakota — RURAL DISTRIBUTION LINES — Tri-County Electric Assn., Plankinton, 595 mi. rural distr. lines, completing previously approved constr., Aurora, Jerauld, Brule and Buffalo Counties. **$910,000.** Raymond H. Reed & Co., Columbus, Neb., consult. engrs. CD 4/6—ENR 4/28.

South Dakota — RURAL DISTRIBUTION LINES—Turner-Hutchinson Electric Co-operative, Marion, 283.6 mi. rural distr. lines, Turner Co. **$275,000.** Buell & Winter, Insurance Exchange Bldg., Sioux City, Ia., consult-engrs. CD 4/14/48—ENR 5/6/48.

Texas—RAIL REPLACEMENT — Southern Pacific Lines, H. J. McKenzie, ch. engr, Southern Pacific Bldg., Houston, installing 113 lb. replacement rails; road bed imprvs., 100 mi. between Hearne and Ennis, **$500,000;** 70 mi. between Tyler and Corsicana, **$350,000.**

South Dakota — RURAL DISTRIBUTION LINES—Upper Grand Electric Assn., Lemmon, 455 mi. rural distr. lines, requisition and rehabilitation generating plant, acquisition 21.2 mi. old rural distr. lines and 2½ mi. old rural distr. lines, Perkins, Meade and Harding Counties. **$620,000.** Scott Eng. Co., Watertown, consult. engr. CD 4/28—ENR 5/19.

South Dakota — RURAL DISTRIBUTION LINES—Whetstone Valley Electric Assn., Milbank, 128 mi. rural distr. lines, sys. imprvs., new tie line, headquarter facilities and completing previously approved constr., Grant Co. **$345,000.** Banister Eng. Co., 1549 University Ave., St. Paul, Minn., consult. engr.

Tenn., Chattanooga—FIRE ALARM SYSTEM —City, City Hall bond election July 14, fire alarm sys. **$500,000.**

Tenn., Columbia—POWER SYSTEM—City, exten. and imprv. city electric power sys. **$300,000.**

Texas—GAS MAIN—Lone Star Gas Co., 1915 Wood St., Dallas, 70 mi. natural gas main between area of Pottsville via Goldthwaite to city limits, **$575,000;** 70 mi. 5½ in. natural gas lines between Marble Falls, Lampasas, Burnet, Lometa, **$150,000;** 100 mi. 6 in natural gas pipeline between San Saba and Kerrville, via Llano and Fredericksburg, **$225,000.**

● **Tex., Fort Worth** — BASEBALL PARK — Fort Worth Baseball Club, N. E. 7 and N. Jones Sts., reconstructing burned out baseball park of Texas League, incl. grandstands, **$1,000,000.**

Tex., Houston — TRAFFIC SIGNAL — City, City Hall, 900 Bragos St., expans traffic signal electric lighting sys. **$900,000.** T. E. Willier, c-o owner, traffic engr. CD 7/31/46—ENR 8/22/46.

● **Tex., Houston**—YARDS and TRACKS—Katy Park Industrial Development Corp., Tom C. Mabry, vice pres., c-o M-K-T Ry. Lines, 1811 Rusk St., plans by Wyatt C. Hedrick, 2201 Fannin St., relocation M-K-T. Ry. yards and tracks. **$3,000,000.**

Tex., Houston—RADIO-TELEPHONE STATION—Southwestern Bell Telephone Co., 208 S. Akard St., Dallas, Tex. and Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga., maritime radio-telephone station, incl. transmitter and receiver units. **$100,000.**

Tex., Port Arthur — RADIO-TELEPHONE STATION — Southwestern Bell Telephone Co., 208 S. Akard St., Dallas, and Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga., maritime radio-telephone station, incl. transmitter and receiver units. **$100,000.**

Tex., Rankin—STADIUM, etc.—Rankin Independent School Dist., Rankin, plans by Wilson & Patterson, 209 Majestic Bldg., Fort Worth, stadium, band, athletic. **$120,000.**

Washington — RURAL DISTRIBUTION LINES—Chelan County Electric Co-operative, Leavenworth, 27 mi. rural distr. lines and sys., imprvs., Chelan Co. **$125,000.**

Washington — RURAL DISTRIBUTION LINES—Okeas Power & Light Co., Eastbound, completing previously approved constr., San Juan Co. **$155,000.**

Wisconsin—RURAL DISTRIBUTION LINES —Eau Claire Electric Co-operative, Eau Claire, 66 mi. rural distr. lines, sys. imprvs., 2-way radio communication sys. and headquarters facilities, Eau Claire Co. **$158,000.**

● **Man., Sherridon** — RAILWAY — Sherritt Gordon Mines Ltd., 25 King St., Toronto, Ont., 100 mi. railway. **$10,000,000.**

● **N. B., Fredericton** — POWER DEVELOPMENT—New Brunswick Power Comm., Fredericton, development 16,000 hp. on Maquacadaie River, **$1,000,000.**

● **Newfoundland, St. Johns** — DAM — Newfoundland Light & Power Co. Ltd., St. Johns, con. at southern end Mobile Big Pond, **$2,000,000.**

Que., Montreal—HEALTH CENTER—Municipality, plans by J. J. Perrault, 3727 Van Horne Ave., health center and public bath, between Eighth and Ninth Aves. **$800,000.** James A. Kearns, 1414 Drummond St., engr. CD 2/28.

Yukon Territory, Mayo Landing — POWER DEVELOPMENT — Dominion Govt., Ottawa, Ont., development 5,000 hp. proj. Mayo River Canyon.

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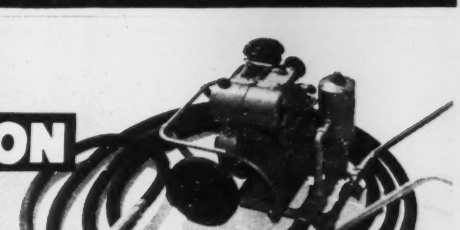

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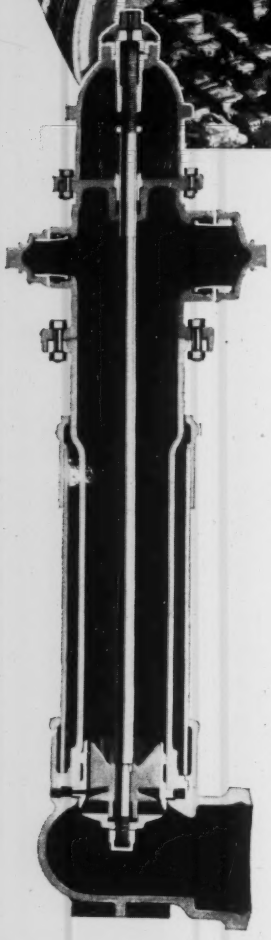

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THE MATHEWS FIREMEN SAY

Why do they say Camden is safe? Because it relies on Mathews Modernized Hydrants. And where there's Mathews, there's safety *plus*.

Mathews Hydrants are so simply and soundly designed there's virtually nothing that *can* go wrong with them. The operating nut is shielded from rain, dust and dirt. The main valve is true compression-type, opening *against* the water pressure. All the working parts are housed in a removable barrel which can be replaced in a matter of minutes, *without excavating*, if the hydrant happens to be knocked down by an out-of-control vehicle. There's no need for on-the-job repairs on a Mathews Hydrant.

Send for our illustrated booklet. You will see why city after city chooses the Mathews Modernized Hydrant as its best protection, and why *your* community should have the same advantage.

OTHER MATHEWS FEATURES: Head can be turned 360° • Replaceable head, nozzle outlets easily changed • Nozzle levels easily raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • Operating thread only part to be oiled • A modern barrel makes any Mathews Hydrant good as new

MATHEWS HYDRANTS

***Made by* R. D. WOOD COMPANY**

Public Ledger Bldg., Independence Square, Philadelphia 5, Pa.

Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

★★★★ Barber-Greene ★★★★

B-G COST SAVING BULLETIN No. 4901

63,000 TONS UNLOADED IN 210 DAYS FOR READY-MIX PLANT

"Not an Hour or a Penny for Repairs"

Griffith, Ind.—The Griffith Ready-Mix Company have speeded up and greatly simplified hopper-car unloading operations at their plant here—as shown by their record of unloading over 1,000 cars in 210 days. Their B-G Belt Car Unloader and Portable Conveyor are clearing 5 to 6 cars a day on a 6-day week basis.

Griffith's unloading setup is simple, low in cost and effective. They keep about 60 cars of aggregate on hand, and their 358 Unloader is easily placed over the rails (it works equally well in pits), and, with the 363 Portable Conveyor unloads to a temporary stock pile at a 3-ton-per-minute clip.

Previously, a crane was used for unloading and stockpiling operations. Now it is free for a variety of other tasks around the yard.

Griffith's operators have found that the 358 won't jam up and will start with a full load on the belt. The 363 Conveyor is equally sturdy, capable of operating 24 hours a day—day in and day out—on a 3-ton-per-minute basis.

847550

The Model 358 Car Unloader and 363 Conveyor combine higher standards of performance, higher capacities and more ability to handle all materials than heretofore available in any other loader-conveyor combination.

One Man Unloads 50-Ton Car in Hour to Radial Storage

Richmond, Va.—One-man unloading to radial storage bins has meant real economy to Tiller Coal Company, Inc. The B-G Coal Unloader and Radial Conveyor provide the flexibility required to unload directly into bins or trucks as the occasion demands. "We have found we can exceed everything Barber-Greene said the setup would do," said L. W. Gress, president of the concern.

847188

Ship Carries Own Unloaders

Mobile, Ala. **The good ship *Rosario* operated by the Suwanee Steamship Company carries two B-G 363 Portable Conveyors to facilitate loading and unloading cargoes of bulk materials such as sulphur, gypsum, etc. Low initial cost and high capacity of the B-G units account for their seafaring role.**

EFFICIENT CONVEYOR PLAN SAVES 90% OF EQUIPMENT COSTS ON $2½ MILLION BRIDGE JOB

Jacksonville, Fla.—The George D. Auchter Company of this city credits much of the savings that made possible its being the low bidder on a 2½ million dollar bridge contract to its new B-G 363 Conveyor and 358 Unloader.

This job, 30 miles from the city, offered no railroad facilities so it was necessary to barge materials to the site. Loading the barges from hopper cars was a real problem. First consideration was given to equipment that would cost over ten times that of the B-G unloading team until they learned how easily the 358 Unloader and 363 Conveyor could do the job.

947385

Frees Crane for Other Work

New Enterprise, Pa. **A 358 Hopper Car Unloader fitted in neatly with the needs of the New Enterprise Stone & Lime Company. It was purchased for unloading cinders from hopper bottom cars, thereby releasing an expensive crane which had been tied up on this uneconomical service. This highly portable Unloader is also being used to unload coal at one of their large storage yards near Bellwood at the rate of one 70-ton car every 55 minutes.**

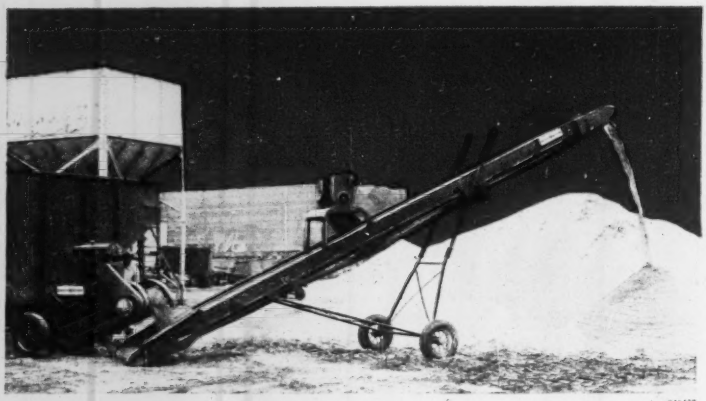
All Materials Handled by B-G Team

The result was that the 358 and 363 unloaded all the materials from cars on the Auchter Company's spur at the riverside. Material was sent directly into the barges through a chute at the discharge end of the 363 Conveyor. This, the company reports, was a high volume, low cost and entirely successful operation which was largely responsible for its being able to secure the contract.

Auchter Company is using the same unloading setup to barge materials for a power plant project located on the river. Mr. Auchter points out that due to the low cost of loading the barges, it is much more economical for his company to supply material to the job site in this manner than to go to the expense of building a railroad spur into the project.

PRTD. IN U.S.A. 155 M 1-49 AM

PORTABLE CONVEYOR UNLOADS 18,350 BARRELS OF BULK CEMENT



4 to 5 Cars per Day

NEGLIGIBLE CEMENT LOSS

In unloading cement from hopper-bottom cars for use on a cement stabilized highway project, the Hyde Construction Company provided one of the most rigorous tests ever confronted by any high-volume unloading equipment. It was a test that was met successfully by the B-G 363 Portable Conveyor which built up a record of 18,350 barrels unloaded—at an average rate of three cars per day. This, in spite of the fact that many were dubious of any such conveyor's ability to handle cement in such quantities. On some days, while the haul was short and the supply of trucks was plentiful, as many as four or five cars were unloaded by this economical, versatile Conveyor.

No unloader was necessary. The hopper end of the 363 was placed in a pit under a tongue-and-groove hopper and fed directly from the car. With a heavy duck cover and canvas spout, there was very little loss of cement in the unloading operations.

SAVES $30,000 ON TRUCK MIXERS BY USING PORTABLE CONVEYORS

Belleville, Ill.—A skillful combination of a B-G 363 Conveyor with a team of dry batch trucks has enabled the Hoeffken Brothers to maintain a fast-moving, ready-mix concrete business with a minimum of investment.

Hoeffken Brothers operate two ready-mix trucks. These trucks are supplied by six dry batch trucks and their B-G Conveyor. The dry batch trucks are used to enable the more costly ready-mix trucks to cut their haul down to a minimum, thereby increasing their daily capacity to the extent where additional ready-mix trucks are not required.

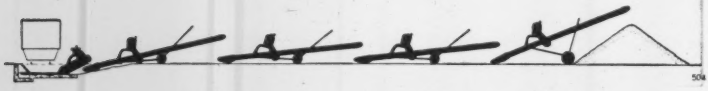
For one paving job located 15 miles from the Hoeffken Brothers batch plant, materials were delivered to the ready-mix trucks $\frac{1}{2}$ mile from the job by the dry batch trucks. The company reports when the haul exceeded this $\frac{1}{2}$-mile figure, they hooked the 363 Conveyor to the water truck and trailed it down the road to another more desirable location. The Conveyor used is 35' long with a corrugated sheet metal cover and a large hopper at the charging end. Batch trucks dump a 4-yard dry batch of concrete into the conveyor hopper and in less than 2 minutes a 4-yard ready-mix truck is ready to go. Hoeffken Brothers figure that they have saved in the neighborhood of $30,000 in over-all investment in production equipment.

Foundry Cuts Coke Unloading Costs 76%

Rockford, Ill.—New, modern unloading equipment has enabled the Greenlee Bros. & Co. foundry to cut costs for unloading a car of coke from $20.00 to $4.80 per car. This substantial saving is accredited to the performance of their 363 Portable Conveyor and 358 Car Unloader—which are quickly paying for themselves in this 100-car-a-year operation.

Additional savings are reported by Greenlee Bros. through the reduction of demurrage charges due to the ability of this unloading-stockpiling "team" to get to work fast and operate steadily at maximum capacity.

Their all-material B-G Unloader and Conveyor are also used to unload fluxstone and foundry sand.



Unloader-Loader Team Does Many Jobs for Cement Plant

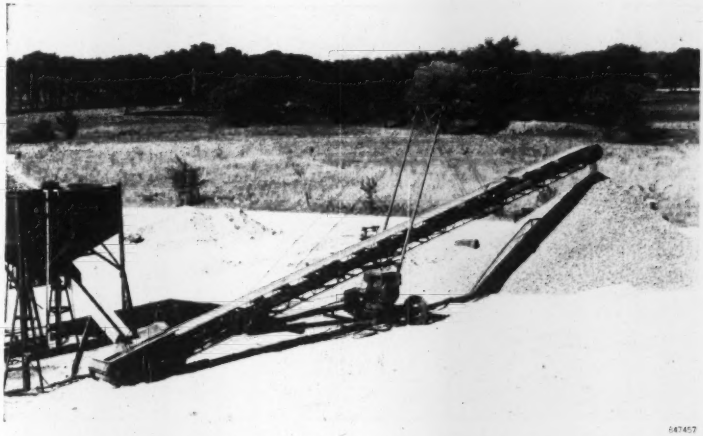
Charleston, S. C.—Production equipment has to be kept working to pay off to the best advantage and it is on this basis that the Carolina Giant Cement Company keeps its B-G 363 Conveyor and 358 Car Unloader busy as general utility equipment on a variety of jobs all over the plant. First, they are frequently at work stockpiling coal from hopper cars along the company's rail siding. Later, the 363 is used in loading the coal from the stock pile for use in the plant.

Gypsum is brought to the plant in box cars and here the 363 is fed by hand to transfer the gypsum from the box cars to a bucket elevator which carries the material up to silos.

Recently when the plant was being altered, it was necessary to drive piling and build foundations inside of the buildings. When this was done, the 363 was used to transfer dirt through a window to the inside of the building for backfilling around the foundation.

Well pleased with the general usefulness of these production tools, Mr. F. M. Murray, shop superintendent, further adds that at times the 358 Unloader has to operate under the most adverse conditions—often the lower half is in water underneath the rails. As in so many other tough jobs, the 358 gives high capacity, dependable performance even under these unsatisfactory conditions.

"A BEAUTIFUL RIG ON OUR SEWAGE PLANT JOB" says B-G OWNER



647457

Heavy Duty Conveyor Runs Up Total of 80,000 Tons of Stone Handled

Spans Canal in Loading Trucks from Railroad Cars

Worcester, Mass.—80,000 tons of 3¼" crushed stone for this city's new sewage treatment plant were loaded to trucks at a 1000 ton per day rate by a B-G Heavy-Duty Conveyor owned by the V. Barletta Company.

Loading up to 1000 tons per day, the 24" x 60' conveyor spanned a 15-foot canal between trucks and the railroad cars. Mr. Barletta reported that this daily capacity was limited only by the ability of the railroad to supply cars, and could have been much higher if they had been available.

Further, Mr. Barletta states, "This conveyor is a beautiful rig. There is absolutely no comparison with any other method of unloading bulk material from cars to truck or storage."

Barletta's B-G Conveyor has been widely useful in the years since it was purchased. A standard Heavy-Duty Conveyor, it is portable, equipped with full-swiveling wheels for radial stockpiling—one of the full line of B-G Portable Conveyors available in belt width of 18", 24", 30" and 36" in lengths up to 150'—capacities to 400 t.p.h.

Half Million Yards of Stone Moved with Practically No Maintenance

Montgomery, Ill.—Nineteen years ago the Fox Valley Gravel Co. bought a Heavy-Duty Portable B-G Conveyor and put it to work in their quarry. At that time, it was an 18" x 30' Conveyor. Today it is an 18" x 60' Conveyor with a total of 500,000 yards of crushed stone to its credit.

H. C. Leppert states it's an impressive record and backs his opinion with a cost sheet that shows the replacement of only one belt carrier in nineteen years.

This conveyor is equipped with all-welded, plain-bearing belt carriers that are noted for rugged endurance. Typical of all B-G "Portables," it is built up of Standardized Sections and is easily shortened or lengthened as in the case here, where it was lengthened to 60' when the need arose.

County Stockpiles 70,000 Yards with Zero Dollars Spent for Repairs

Geneva, Ill.—The Kane County Highway Department furnishes added evidence of the usefulness and low operating expense of B-G Heavy-Duty Portable Conveyors in a recent report. The conveyor has seen constant service during the winters since 1944—stockpiling 70,000 yards of crushed stone for use in summer highway work—and they have yet to spend a penny for replacement of any part. An 18" by 60' unit, their B-G Conveyor helps materially in promoting low cost highway maintenance.

Have you seen the B-G City?

Here is a novel and interesting color illustration of the imaginary Barber-Greene City, showing almost countless operations in material handling, ditching and bituminous construction.

Write for your free copy.

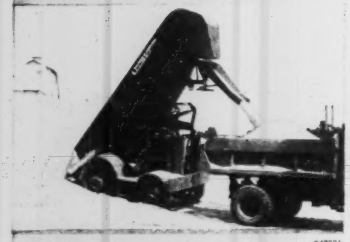
Peach Pits by the Yard Via Versatile Portable Conveyor

Los Angeles, Cal.—Peach pits, walnut shells, apricot pits and the like are not allowed to go to waste by progressive food industry operators such as the Agrashell Corporation, producers of insecticides, resins and oils. And companies such as this are turning to the B-G Model 363 Portable Conveyor as an ideal means to handle this exotic bulk material in large quantities on a steady, day-in and day-out basis. Here the material is brought to the plant in side-dump gondola cars and fed through a portable hopper to the receiving hopper of the B-G Conveyor. The 363 transports material into the plant for further processing.

646372

THE B-G LINE CUTS COSTS ALL ALONG THE LINE...

See Barber-Greene for:

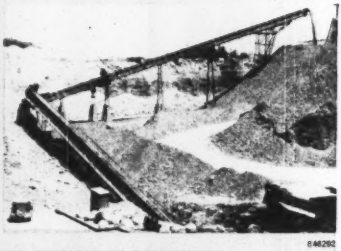


847331

B-G BUCKET LOADERS: Crawler or pneumatic-tire mounted. For low cost truck loading of bulk materials. Capacities up to 3 cu. yd. per min.

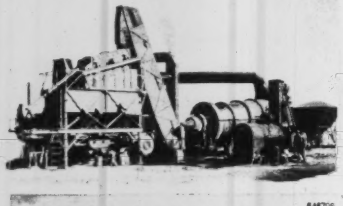
848389

B-G DITCHERS: Crawler and pneumatic tire mounted, for digging trenches from 5½" wide, 4' deep to 24" wide, 8' 3" deep.



846292

B-G PERMANENT CONVEYORS: Complete, standardized equipment including carriers, take-ups, drives, frames, etc.



848706

B-G BITUMINOUS PLANTS: Highly portable plants for producing all types of mixes—up to 120 T.P.H.

847350

B-G FINISHERS: Automatically place smooth level surface regardless of variations in subgrade.

846434

B-G COAL YARD EQUIPMENT: Belt and chain-and-flight Portable Conveyors; self-propelled, pneumatic-tired. Also, hopper-car Unloaders.

Use Barber-Greene's 30 Years of Experience to Help You Plan Your Job. It can be Valuable and is at Your Service

It always pays to eliminate guess work. Barber-Greene offers you the benefit of over thirty years experience in designing and building equipment proved year after year on jobs—and in industries—like yours. Barber-Greene's Representatives are material handling specialists with practical experience in successfully applying the right machine to jobs like yours. Consult your Barber-Greene Distributors, or write directly to Aurora, Illinois, for information you need to do your job most profitably.

Barber-Greene Company
Aurora, Illinois
Cable address "Bargreene"

Send information on the Barber-Greenes checked below as indicated:

- ☐ 363 Conveyor
- ☐ 358 Unloader
- ☐ Heavy-Duty Conveyor of _____ belt width, _____ length and or _____ capacity
- ☐ _____ Other B-G Equipment
- ☐ Have a Representative Call

Name _____

Company _____

Position _____

City _____ Zone _____ State _____

Before You Bid . . .
Before You Buy . . .
Send This Coupon!

The coupon will bring you complete information on any Barber-Greene machine without cost or obligation.

We will be glad to have our representative call to discuss your material handling problems with you.

We maintain a Department for the sole purpose of solving your material handling problems.

BARBER-GREENE COMPANY
Aurora, Illinois

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
July Materials and Labor Prices will appear in the July 7, 1949 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C.L. lots incl. $1.00 per bbl. for bags, cash dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, t.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in., truckload del. per block	CONCRETE Ready Mixed 1-2-4, over 50 c.y., del.
	Cloth	Paper	Bulk	Gravel ¾ in.	Gravel 1½ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand, gray; lt. wgt. agg.	3,000 psi, 6 sack mix, c.y., del.
Atlanta	$4.11	$3.36	$3.05	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.1725	$11.00
Baltimore	4.12	3.37	3.06	2.30‡a	2.30‡a	1.95‡a	2.60‡a	2.70‡a	2.45‡a	2.45‡a	.16	10.25
Birmingham	3.80	3.05	....	2.06	2.06	1.66	2.50	2.50	1.00	1.20	.165	7.75
Boston	4.50	3.75	3.44	2.50a	2.50a	2.50a	1.60a	1.70a	....	....	.17	10.50h
Chicago	3.61 3.67	2.86 2.92	2.50 2.62	2.75‡b	2.75‡b	3.20‡b	2.75‡b	2.75‡b	2.00‡	2.00‡	.20	.20b
Cincinnati	4.13	3.38	3.07	1.85‡c	1.85‡c	1.75‡c	2.95‡b	2.95‡b	2.30	2.30	.19	.225	10.60d
Cleveland	3.92	3.17	2.87	1.90‡b,f	1.65‡f	1.55‡	3.55‡a	3.55‡a	2.75	2.75	....	.21	11.80‡
Dallas	3.57	2.82	2.52	2.00	2.15	1.75	2.10	2.05	....	....	.080b	.250	9.30
Denver	....	3.50	3.20	1.85	2.00	1.15	....	....	....	....	.20	.23a	9.65
Detroit	3.85	3.08	2.80	2.05‡	2.05‡	2.20‡	3.00‡	3.00‡	3.00‡	3.00‡	.17	.18a	9.60f
Kansas City	3.91	3.16	2.85	1.95	1.95	1.30	1.45d	1.45d	....	....	.15a	.215eh	10.40b
Los Angeles	....	3.72a	3.32a	1.94‡a	2.04‡a	1.74‡a	1.84‡a	1.92‡a	....	....	.85f	....	10.05h
Minneapolis	4.09cd	3.34cd	3.03cd	2.30‡aa	2.30‡aa	1.35‡aa	2.50‡aj	2.50‡aj	....	....	.21c	....	10.30ifc
Montreal	....	2.40ac	2.31ac	1.25bf	1.75bf	....	.85ai	1.10ij	....	....	.2470	.1770a	8.95ek
New Orleans	....	3.07	2.75	2.32	2.32	1.82	....	....	1.05	1.25	.23	....	10.65
New York	4.21	3.46	3.15	2.00dk	2.00dk	1.45dk	2.25dl	2.25dl	....	....	.18b	.18ah	10.30a
Philadelphia	3.90 4.20‡	3.15 3.45‡	2.84 3.14‡	2.30‡	2.40‡	2.05‡	1.90‡	1.95‡	1.50	1.50	18‡.22	....	9.85
Pittsburgh	3.90	3.18	2.85	2.05‡	2.05‡	2.00‡	2.50‡	2.50‡	2.05	2.05	.22d	.22d	11.00
St. Louis	3.80b	3.05b	2.75b	2.00‡am	2.10‡am	2.00‡am	1.60j	1.60j	....	....	.215	.24cj	10.40
San Francisco	....	3.78	2.98	1.84	1.84	1.94	1.94	....	....	....	....	.25e	10.75e
Seattle	....	3.45a	2.95a	2.75‡bm	2.75‡bm	2.75‡bm	3.50‡bm	3.50‡bm	....	....	.22j	.3135	9.75j

‡ Delivered. *Prices incl. dealers comm. except as noted.
CEMENT: *a* Subj. to 10c dis. *b* Less 2% for cash. *c* C.L. price dealers' comm. not incl. *d* Dealers sell only I.C.L.
SAND, GRAVEL, STONE & SLAG: *a* Truck lots. *b* Per cu. yd. *c* 5 tons or more. *d* F.o.b. plant. *e* 1". *f* Pea gravel. *g* Less 5% for cash. *h* Less than 5 tons. *i* Sales tax incl. *j* F.o.b. quarry. *k* Barge lots asd. *l* F.o.b. scow Hudson River. *m* Less 2½ for cash.

CONCRETE BLOCK: *a* Cinder. *b* Waylite. *c* Haydite. *d* Celocrete. *e* 5⅓ x 8 x 12 in. *f* 8 x 4 x 16 std. wgt. *g* F.o.b. truck at job. *h* F.o.b. plant. *i* Less 2% for cash. *j* Less 1% for cash.
READY MIXED CONCRETE: *a* 5 cu. yds. or over del. Man. *b* 25 cu. yds. or more. *c* 10-100 cu. brackets. *d* Truck loads up to 500 cu. yds. *e* 2,000 lb. conc. *f* 2500 lb. comp. *g* Aver. haul 7.9 mi. zone. *h* Less 50c for cash. *i* 5% off for cash. *j* 2% off for cash. *k* Sales tax included.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month on carload deliveries, no trucking, same as dealer cash discount 10c per bbl. for payment within 15 days of date of invoice. Subject discount 10c per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For cloth bags, add $1.05 per bbl., 25c refund allowed for each returnable bag; for paper bags add 30¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk
Richard City, Tenn.	$2.40‡	Buffington, Ind.	$2.20	Steelton, Minn.	$2.40	Muskegon, Mich.	$2.40‡	Toledo, O.	$2.40‡
Chickfield, Ga.	2.40‡	Independence, Kan.	2.30	Leeds, Ala.	2.25	*Saginaw, Mich.	2.35‡	Milwaukee, Wis.	2.40‡
Kingsport, Tenn.	2.40‡	Hannibal, Mo.	2.35	Duluth, Minn.	2.40	Wyandotte, Mich.	2.30‡	Green Bay, Wis.	2.40‡
West Des Moines, Iowa	2.30‡	Northampton, Pa.	2.30	Hudson, N. Y.	2.30	Buffalo, N. Y.	2.40‡	Ironton, O.	2.30
Nazareth, Pa.	2.30‡	Universal, Pa.	2.30	Alpena, Mich.	2.25‡	Oswego, N. Y.	2.40‡	Montreal City	2.13
Bath, Pa.	2.30‡	Waco, Tex. (+ 9¢ tax)	2.20	Detroit, Mich.	2.40‡	Cleveland, O.	2.40‡	W. Winfield, Pa.	2.30‡

‡ *Prices to hold for second quarter of* 1949.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT		ASPHALT BINDERS—FLUXES		CUTBACK ASPHALT		ROAD OIL	ASPHALT EMULSION (Quick-breaking)	
	Granite Per M lots of 50,000	Brick per M 3x4x8 in.	Wood per sq. yd. 3½ in.	Per ton, less than 80 penetration		Per gal., 80-300 penetration		Per ton		Per gal.	Per gal	
	4x8 in.	carload lots	6-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$73.00	$35.00	$2.25	....	....	....	....	....	....	....	....	....
Baltimore	150.00‡	52.70‡	....	$23.00	....	$.095	$0.15	$.095	$.17	$.095	$.095	$0.115
Birmingham	....	32.50	....	....	....	....	....	....	....	....	....	....
Boston	....	....	....	24.50a	$35.50a	.1030a	.185a	.1150e	.205ae	.10a	.1130	.205a
Chicago	150.00‡a	55.00 SS.00‡b	3.10 4.15‡f	21.10b	30.60b	20.10be	29.60be	.092	.0950be	.0806	.1025 .1075e	.15 .1675b
Cincinnati	....	....	....	23.50k	....	.1025	....	.1030e	....	....	....	....
Cleveland	180.00	49.00‡	3.70j	25.00	35.00	25.00e	34.50e	.12e	.22e	.11	.125	.25
Dallas	....	40.00	....	23.95	42.99	.1012	1.808	26.99	47.77	.0987	.1062	.1423
Denver	....	43.00	....	....	....	....	....	....	....	....	....	....
Detroit	....	....	....	28.45	35.45	....	....	.1188e	....	....	....	.1975
Kansas City	....	40.00d	....	19.05el	....	....	....	.075e	....	.065e	....	....
Los Angeles	....	....	....	16.10dm	31.60dmp	16.10dp	31.60dp	17.60d	24.60dp	16.10dp	.0825g	.1625g
Minneapolis	....	....	2.83f	27.00	37.00	23.00e	34.00e	27.00	37.00	.105	.13	.23
Montreal	137.00	....	....	25.00a	34.65a	15.80aa	20.05aa	15.70aa	17.70aa	14.20a	.174a	.215a
New Orleans	....	....	....	20.00a	a	20.00ae	a	.085ae	a	.095	.0975	.16f
New York	....	....	2.50f	25.50	37.80q	24.50e	33.85q	.1040e	.1867qe	.0990	.1040	.1847q
Philadelphia	150.00	80.00 90.00	4.06	23.00	....	22.00e	....	.095e	....	....	....	....
Pittsburgh	165.00	42.00	4.50	26.00	39.00	11	23	27.00	40.00	.095	.10	.21
St. Louis	....	....	....	21.65f	....	....	....	....	....	....	.1081	.1075
San Francisco	....	57.75e	....	18.10j	32.60bp	18.10jbe	....	20.10j	....	....	.0825	.1625
Seattle	....	....	....	16.60bk	37.10k	16.60bke	....	18.60b	22.60be	17.10be	.0825k	.0925bk

‡ Delivered.
PAVING BRICK & BLOCK: *a* CL, 6 3/4 x 4 x 8. *c* 2¼ x 8½ x 4. *f* F.o.b. Buffalo, Kans. *e* Not used. *f* 2" interior 6" treat. *g* 3".
ASPHALTS: *a* Price at plant, Everett, Mass. *b* F.o.b. refinery, Lockport, Ill. *c* F.o.b. Sugar Creek, Mo. *d* F.o.b. refinery, El Segunda. *e* F.o.b. Baton Rouge. *f* F.o.b. Wood River or Roxana, Ill. *g* F.o.b. Richmond, Calif. *k* F.o.b. Martinez, Calif. *l* Bulk refinery. *j* F.o.b. refinery, Englewood, Calif. *k* 50-300 penetr. *l* Less than 100 penetr. *m* 40-80 penetr. *n* Tax incl. *o* Drums not avail. *p* Shipped in steel bbl. *q* Use of reconditioned drums. *r* In customer's drums. *s* Shipped in drums, per drum. *t* 55-gal. drums. *u* Per 100 gal. *v* Per ton. *w* Per gal.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES—PLATE	REINF. BARS[a][b]	RIVETS ½-in. structural	SHEET PILING	STEEL RAILS Per Net Ton			TRACK SUPPLIES			
		Billet		Base	Standards	Light[c][f]	Re-rolled	Angle Bars	Std. Spikes	Tie Plates[g]	Track Bolts[d]
Birmingham Area	$3.25	$3.35	$6.75		$64.00	$71.00	Not	$4.25	$5.35	$4.05	.....
Chicago Area	3.25	3.35	6.75	$4.05	64.00	71.00	avail-	4.25	5.35	4.05	.....
Pittsburgh Area	3.25	3.35	6.75[e]	4.05	64.00	71.00	able	4.25	5.25	4.05	.....
Buffalo Area	3.30	3.35	6.75	4.05	64.00	71.00		4.25	5.35	4.05	$8.50
Cleveland	"	"	6.75	"	"	"		"	"	"	8.50
Youngstown Area	"	3.35	"	.....	.....	.....		.....	5.35	.....	.....
Geneva	3.25	.....	.....	.....	.....	.....		.....	.....	.....	.....
Los Angeles	"	4.25	"	"	"	"		"	5.35	"	"
Pueblo	3.25	3.35	"	"	64.00	71.00		4.25	5.35	4.05	8.50

a Fabricated: To consumers: $4.25; except $5.00 Seattle, Wash. *b* Rail steel price $3.85; Williamsport, Pa. *c* Rail steel $102 per ton Williamsport, Pa. *d* Treated. Untreated $8.25. *e* Except $6.60 Minnequa, Colo. *f* Except $8.00 Minnequa, Colo. *g* Except $4.20 Pittsburg, Calif.; $4.50 Seattle, Wash.

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES	REINFORCING BARS, per 100 lb., base price *a*			EXPANDED METAL LATH, Per 100 sq. yd., carload lots		WELDED FABRIC REINFORCING[d], Per 100 sq. ft., carload lots		
	Per 100 lb. base price	5 tons to carload lot[b] New billet	Rail steel	Add switch	$ cwt. for Del.	Std. diamond mesh, 3.4 lb.	Std. ribbed, 3.4 lb.	4x16 in., No. 5 & 10 wire	4x12 in., No. 8 & 12 wire	6x6 in., No. 6 & 6 wire
Atlanta	$4.75	$5.225[k]	$5.225[k]	$.025	$.10	$31.50	$31.50			
Baltimore	5.51	4.47[l]	.....	.....	.10	40.00	40.00			
Birmingham	5.08	5.08	5.50	.05	.15	43.00[s]	45.50			
Boston	5.55[t]	5.46[t]	5.34[t][e]	.10	.15	31.00	33.00			
Chicago	5.05	4.70[u][f]	4.70[f]	.05	.....	31.00[‡]	33.00[‡]			
Cincinnati	5.45[v]	5.58[w]	.....	.....	.....	31.00[‡ee]	35.00[‡ee]			
Cleveland	5.01[kk]	4.37	.....	.....	.10	34.50	36.50			
Dallas	6.50	6.50[x]	6.50	.....	.....	43.50	46.00			
Denver	6.45	6.15[e]	.....	.....	.....	47.00[s]	44.50[gg]			
Detroit	5.28	.....	.....	.....	.10	33.00[z]	44.00[z]			
Kansas City	5.50	4.90[f]	5.10	.....	.....	37.00	39.00			
Los Angeles	5.75[y]	6.15[bb]	.....	.....	.15	37.00[f]	44.00[f]			
Minneapolis	5.20	5.20[ll]	5.20[ll]	.....	.15	34.50	36.50			
Montreal	5.25[h]	5.15[h]	5.15[h][e]	.....	.....	44.10[h]	48.80[h]			
New Orleans	.....	5.00[ss]	.....	.05	.10	32.00	32.00			
New York	5.13[z]	4.75[f]	5.30	.....	.15 .20	35.00[tt]	35.00[tt]			
Philadelphia	5.25	5.25[o]	.....	.....	.....	30.00[f]	32.00[f]			
Pittsburgh	4.30 4.40	4.30 4.40	4.30 4.40	.05	.10	32.50	34.50			
St. Louis	5.45[k]	5.25[x]	5.25[x]	.....	.....	42.00[xx]	48.00[xx]			
San Francisco	5.90[u]	5.65	.....	.....	.....	36.50	38.50			
Seattle	4.30[e]	5.25[d]	.....	.....	.....	52.00[mm]	42.00[mm][ii]			

‡ Delivered. *a* Mill prices. *b* 1.5 tons, add 35c. Less than 1 ton, add 50c. *c* 20 tons or over base. *d* Mill price plus freight. *e* F.o.b. plant. *f* Includes delivery in free delivery zone. *g* High scrap steel prices cut former 15c. differences between new billet and rail steel. *h* List price. Dominion tax exempt. Provincial and Municipal tax extra. *i* Plus Dominion, Provincial and Municipal sales tax. *j* Price per ton. *k* F.o.b. city. *l* Intermediate and hard grade, new billet. *m* Per sq. yd. *n* 5 to 15 tons base. *p* Del. of 5000 sq. yd. or less. *q* Std. ribbed, 4 lb. per sq. yd. *r* 5 tons or over. *s* L.C.L. *t* Asphalt coated. *u* Note: Revised size extra, ¼ in., 14 in.; 1¼ in., 10c.; 1½ in., 20c.; 1¾ in., 35c.; 2 in., 55c.; ¼ in., $1.30. *v* Under 20 tons. *w* Copper bearing. *x* 2.5 lb. per sq. yd. *y* $4.00 transportation tax included. *z* Copper alloy. *aa* Delivered truck to job. Contractor to do unloading. *bb* Includes 50c extra for ¼ in. size. *dd* F.o.b. dock. *ee* Early cars. *ff* Carload lots. *gg* Including sales tax. *hh* Delivered price is $5.01. *ii* Rolled at Geneva mill. Shapes rolled at Fontana, $6.00. *kk* 27 ribbed. *ll* 5 to 8 tons. *mm* 2% off for cash.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T			CLAY DRAIN TILE ASTM C4-24 *Per 1,000 ft., carload lots, f.o.b.		CONCRETE SEWER PIPE Per ft., delivered; ASTMC 14-41	
	Per net ton f.o.b. 6 in. to 24 in. *a*	std. 8 in. ss.	12 in. ss.	24 in. ds.	36 in. ds.	6 in.	8 in.	12 in.	24 in.
Atlanta	$89.50	$0.43	$0.67	$3.30	$7.00	$114.00	$140.00	$0.45	$2.00
Baltimore	93.88	.52	.975	4.21	9.34	178.20	228.00	.80	2.25
Birmingham	82.50	.40	.72	2.84	.....	210.00‡	375.00‡	.90	2.50
Boston	97.46	.441*uvx*	.8505*uvx*	3.87*uvy*	10.36*uvy*	173.40	267.60	1.45[*mz*]	3.60[*mz*]
Chicago	90.49	.59	1.14	4.81	13.45	150.00‡	270.00‡	.70	2.35
Cincinnati	94.90	.441	.8505	3.30	9.53	220.00‡	340.00‡	.60	2.25‡
Cleveland	97.13	.357*z*	.6885*z*	3.015*z*	8.405*z*	147.50	231.00	.65	2.70
Dallas	99.28	.363	.657	2.955	9.25	.....	.....	.49	1.60
Denver	104.36	.41*dd*	.714*dd*	2.98*dd*	.....	.....	.....	.74*dd*	2.50*dd*
Detroit	92.13	.553	1.10	4.20	12.75	210.00‡*m*	300.00‡*m*	.65	2.50
Kansas City	98.41	.418*m*	.76*m*	.....	.....	215.00*m*	375.00*m*	.60*l*	2.00*l*
Los Angeles	111.06	.426	.927	4.532	11.298	193.00‡	324.00‡	.72	.....
Minneapolis	100.67	.62*mo*	1.12*mo*	4.35*m*	.....	.....	.....	1.29*h*	3.67*h*
Montreal	100.00	.77*s*	1.35*s*	4.47*s*	8.50*ss*	.60*m*	.88*s*	75.00‡*kkn*	240.00‡*kkn*
New Orleans	92.68	.412	.762	3.955	9.15	231.00*bb*	405.00*bb*	.55	1.95
New York	92.80 97.50	.62	1.14	4.45	12.30	.....	.....	1.00	2.50
Philadelphia	90.97	.54	.99	4.08	10.28	235.00‡	300.00‡	1.25*h*	3.20*h*
Pittsburgh	97.76	.364*m*	.702*m*	2.70*m*	6.625*m*	134.20	197.40	1.05*n*	2.50*q*
St. Louis	94.27	.48	.87	3.42	8.05	.....	.....	1.10*ll*	2.25*h*
San Francisco	111.06	.50*d*	.99*d*	4.32*d*	10.80*d*	188.00*ll*	313.00*ll*	.69	2.85
Seattle	112.95	.519	.919	.....	.....	150.00*e*	.....	.81*ee*	2.40

| | *WROUGHT STEEL PIPE— (Full standard weight) | | |

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F. O. B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 3 (1948 rules, old No. 2) common or better and for No. 1 N. C. Box.

Prices in Bold Face)

All Fir boards, dimensions, planks No. 2. Fir small timbers and timbers as No. 1. Lengths up to 20 ft.

(Prices in dollars)

		1x6 S4S	1x8 S4S	2x4 S4S	2x6 S4S	2x8 S4S	2x10 S4S	3x12 R/A	6x12 R/A	12x12 R/A
Atlanta	†	**$70 00**	**$71 00**	**$60 00**	**$62 00**	**$65 00**	**$68 00**	**$70 00**		
Baltimore		**65 00**	**65 00**	**60 00**	**62 00**	**64 00**	**68 00**	**85 00**		
		82 00	*82 00*	*78 00*	*78 00*	*78 00*	*84 50*	*81 00*	*81 00*	
Birmingham	†	**83 00**	**87 50**	**73 00**	**75 00**	**78 00**	**82 50**	**95 00**		
	†	*86 00*	*80 00*	*77 00*	*77 00*	*77 00*	*93 00*	*98 00*	*98 00*	
Boston		78 00*a*	78 83*a*	83 00*a*	83 00*a*	83 00*a*	88 00*a*			
		88 00	*88 00*	*90 00*	*78 00*	*98 00*	*98 00*	*98 00*	*98 00*	
Chicago	‡	**84 00**	**89 00**	**79 00**	**81 00**	**83 00**	**89 00**	**93 00**		
	‡	*84 00*	*82 00*	*85 00*	*80 00*	*82 00*	*82 00*	*92 00*	*92 00*	
Cincinnati		**88 00**	**100 00**	**85 00**	**90 00**	**97 50**	**98 00**	**110 00**		
		126 00	*125 00*	*96 00*	*100 00*	*120 00*	*124 00*	*130 00*	*130 135*	
Cleveland	*h*	**68 70**	**70 72**	**63 67**	**68 72**	**73 75**	**78 80**			
Dallas	†	**58 00**	**61 00**	**61 00**	**57 00**	**58 00**	**61 00**	**90 00**		
Denver		*Not in stock*		*95 00*	*95 00*	*95 00*	*95 00*	*101 00*	*112 00*	*114 00*
Detroit	*h*	**73 00**	**77 00**	**61 00**	**74 00**	**76 00**	**80 00**			
		80 00	*82 00*	*78 00*	*78 00*	*78 00*	*77 50*			
Kansas City										
	e	*87 00*	*82 50*	*89 75*	*90 00*	*90 00*	*90 00*	*99 00*		
Los Angeles	*	*73 00*	*78 00*	*78 00*	*78 00*	*78 00*	*78 00*	*85 00*	*95 00*	*85 00*
Minneapolis	‡*	*105 00*	*105 00*	*105 00*	*105 00*	*105 00*	*105 00*			
Montreal	*ab*	**73 00**	**76 00**	**73 00**	**75 00**	**76 00**	**85 00**			
		155 00	*155 00*	*155 00*	*155 00*	*155 00*	*155 00*	*185 00*		
New Orleans	†	**66 00**	**70 00**	**70 00**	**75 00**	**75 00**	**70 00**	*85 00*		
	†	*68 70*	*68 70*	*71 00*	*75 00*	*78 50*	*78 50*	*87 00*	*87 00*	*87 00*
New York	‡	**80/85**	**82 50/87 50**	**Range from $72 50 to $82 50**				**95 100**		
	‡			*Range from $82 50 to $92 00*					*105 120*	*105 120*
Philadelphia				**Range from $90.00 to $100.00**						
				Range from $105.00 to $115.00					*122 00*	*122 00*
Pittsburgh	†	**75 80**	**75 80**	**75 80**	**75 80**	**75 80**	**70 86**	**100 00**		
	†	*90 100*	*90 100*	*90 100*	*100 110*	*100 110*	*100 110*	*120 130*	*120 00*	*120 00*
St. Louis	‡c	**85 00**	**87 25**	**74 25***d*	**74 25***d*	**91 75***e*	**94 00***e*	**95 00**		
	‡c			*99 50e*	*101 25e*	*102 25e*	*102 25e*	*100 50*	*130 00*	*130 00*
San Francisco	†	*68 00*	*68 00*	*68 00*	*66 00*	*66 00*	*65 00*	*65 00*	*65 00*	*65 00*
Seattle	†	*62 50*/	*62 50*/	*62 50*/	*62 50*/	*62 50*/	*62 50*/	*62 50*/	*62 50*/	*62 50*/

	LONG LEAF Y. P.		PLYWOOD
	Merchantable grade up to 20 ft.		Rail freight increment* (See note for base price)
	2x12 R/A	12x12 R/A	3/8"
Atlanta			$22 32
Baltimore	165 00	165 00	22 86
Birmingham	130 00	125 00	21 78
Boston	105 00	105 00	22 86
Chicago	116 00	116 00	18 72
Cincinnati			21 78
Cleveland			22 20
Dallas	82 50	90 00	18 72
Denver			13 92
Detroit			21 78
Kansas City			16 56
Los Angeles			13 38*mb*
Minneapolis			16 56
Montreal			
New Orleans	100 00	105 00	18 72
New York	175 200*f*	175 200*f*	22 86
Philadelphia	166 00	166 00	22 86
Pittsburgh			22 56
St. Louis	104 75	*137 50*	18 72
San Francisco			10 08*a*
Seattle			12 30*a*

† F.o.b. mill. ‡ Delivered. * Retail-LCL. * Yard prices.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* *a* Spruce. *b* Tax exempt. *c* 5M lots. *d* 8 to 12 ft. lengths. *e* 8 to 16 ft. lengths. *f* 18 ft. or over. *g* No. 1 common. *h* No. 2 common.

PLYWOOD: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on 3/8" $120.00; on 1/2" $164.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a* Lower rate by water shipment. *b* 50,000 lb. minimum. * Freight rate increase of 4c per cwt., effective Jan. 11, not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from jobbers' list, Jan. 16, 1948		EXPLOSIVES — Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
	Single or Double Thickness A quality	B quality	
Atlanta	76%	76%	$0.2025
Baltimore	70-10%	71-10%	.2025
Birmingham	68%	68%	.1775
Boston		60%*a*	.2025
Chicago	67%	67%	.2025
Cincinnati	66-10%*e*	66-10%*e*	.2025
Cleveland	66-10-10-10%*	66-10-10-10%	.2425
Dallas	65%	65%	.215
Denver	66%	66%	.2075
Detroit	66-10-10%	66-10-10%	.2025
Kansas City	65%*e*	65%*e*	.2075
Los Angeles	58%	63%*f*	.21
Minneapolis	64%	64%	.2075
Montreal	40-5%*bc*	40-10-5%*bc*	18.90*h*
New Orleans	68%	68%*e*	.2125
New York	71%	72%	.32*g*
Philadelphia	70%	70%	.2025
Pittsburgh	70%	70%	.175
St. Louis	70-10%	70-10%	.2075
San Francisco	66%	73%	.2075
Seattle	54%	55%	.21

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass. *a* Jobbers' list price per box, 14 x 20 ins., $20.75 for A quality, $18.00 for B quality; 14 x 20 ds, $30.75 for A quality, $26.00 for B quality. * Discount from list, Sept. 1948; sales tax included; but 6% tax exemption not allowable for. * Single thickness. *c* Discount from list of Aug. 15, 1938. *f* ss; ds—6.2%. *e* Double thickness 65%.

Explosives. * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *a* In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St.; add delivery charge of $9.00 per trip. *b* F.o.b. city per 100 lb. for rate, 40%. *c* For rate 60%, $20.65.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C. L. 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.155	$0.1825	$0.2025
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.16 — .1625	.1875 — .20	.2075 — .22
Rocky Mtn. States	.16 — .1725	.1875 — .20	.2075 — .225
Pacific N. W. States	.1575 — .17	.19 — .2025	.21 — .2325
Pacific S. W. States	.152 — .1625	.1875 — .195	.2075 — .2175

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark on, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail — Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.36	....
12-in.— 2-ft. from butt	6-in.	50 to 59-ft.	.39	....
12-in.— 2-ft. from butt	6-in.	60 to 69-ft.	.43	....
12-in.— 2-ft. from butt	6-in.	90 to 100-ft.	....	.72
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	.73
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.43	.80
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.47	.74
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.60	.75
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	....	.76
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	.80

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr
Boston	Oak	....	....	....	....
	Pine	....	....	....	....
New York	S. L. Sap Pine	$1.65	$2.85	$2.00	$3.30*f*
	Mixed Oak	1.80	3.05	2.50	3.60
Birmingham	Hardwood	1.00	1.60*a*	....	2.25*a*
Chicago	Red Oak	2.55	2.60*a*	....	3.40 3.65*a*
Los Angeles	Douglas Fir	....	3.00*a*	....	..
	Redwood	1.86	....	....	..
Philadelphia	Red Oak	2.33	3.13	3.10	4.25*a*
St. Louis	White Oak	2.42	....	3.22	..
	Red Oak	2.42	2.97*a*	3.12	4.05*a*
	Sap Pine or Cypress	3.04*a*	....	....	..
San Francisco	Douglas Fir	1.25*e*	2.24*f*	1.70*f*	3.05*af*
Montreal	Birch or Maple	.... *h*	.... *h*	.... *h*	.... *h*

Tr.—Treated. Untr.—Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell. *e* Green. *f* F.o.b. cars. *h* No constant price available. * Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$4.25
Chlorine cylinders, liquid, per lb. f.o.b. works	.07—.12
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	22.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	1.80
Soda ash, 58%, in paper bags, per 100 lb. dense	1.50
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.50
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	7.00

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over. 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over. 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton. In paper, Carload lot. Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	.....	.....	.....	.....	.....	.....	$25.00	$25.00	$19.00	$17.50	$17.50
Baltimore	$170.00	$180.00	$320.00	$375.00	.....	.....	32.00*k*	35.00*k*	30.00	20.00	...
Birmingham	97.50	104.00	195.00	231.00	.....	.....	20.00*ff*	22.50*gg*	24.67	18.10	.....
Boston	145.65†	155.35†	291.30†	330.15†	.....	.....	32.00*a*	35.00*a*	30.80†	26.40†	.....
Chicago	115.00	122.50	230.00	.....	.....	.....	21.00	23.00	28.50	19.50	.....
Cincinnati	170.00*j*	180.00*j*	240.00*jdd*	330.00*j*	330.00*j*	330.00*j*	34.00*j*	34.00*j*	22.25*j*	20.50*j*	.....
Cleveland	118.00*ee*	126.00*ee*	236.00*ee*	.....	.....	.....	28.50	28.50	24.00	22.00	27.50*ee*
Dallas	.....	110.00	.....	.....	.....	.....	18.75	33.25	28.00	22.00	.....
Denver	.....	.....	.....	.....	.....	.....	32.00	32.00	34.80*bb*	28.00*bb*	34.00*bb*
Detroit	117.08	124.88	234.15	234.15	$290.68	$332.20	30.00*ee*	31.50*ee*	28.00	26.50	26.50
Kansas City	115.50	122.50	...	245.00	305.50	367.00	22.63*a*	25.12*a*	36.00*p*	30.00*p*	30.00*p*
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	20.00§	.....	.....	36.00	32.00
Minneapolis	152.00*p*	176.00*p*	317.00*p*	176.00*wp*	.....	.....	30.00*p*	.....	35.00*bbe*	26.00*bbe*	35.00*bbde*
Montreal	110.00*aq*	120.00*aq*	225.00*aq*	.....	.....	.....	25.50	37.00	12.50*ub*	14.00*ub*	...
New Orleans	160.00	160.00	300.00	.....	.....	.....	29.00	.....	38.00	26.00	37.50
New York	118.20*h*	126.00*h*	173.30*ch*	189.00*hn*	.....	.....	33.00	.....	34.40	26.80	.....
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	27.00	30.00	29.75	17.50	24.50
Pittsburgh	98.50	105.80	181.85	207.30	265.85	303.60	26.00	38.00*y*	20.45	16.65	2.97*m*
St. Louis	120.00	138.50	252.50	252.50	339.50	.....	32.50*al*	30.50*al*	80*aap*	60*aap*	1.00*aaspee*
San Francisco	132.00*a*	148.50*a*	198.00*dda*	148.50*a*	.....	.....	30.00	.....	24.95	24.95	2.49*m*
Seattle	150.00*cc*	160.00*cc*	.....	160.00*ccw*	.....	.....	32.00*s*	39.00*s*	32.00*ahh*	32.00*ahh*	3.60*mhh*

‡ † F.o.b. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 x 12 in.-3 cell. *d* Pulverized hot. *e* 5% 10th following month. *f* 5½ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *i* F.o.b. warehouse only. *j* Truck load or over. *k* $1.00 discount. *l* Red face. *m* Per bbl., 180 lb. *n* 7½ x 7½ x 12. Speed tile. *o* F.o.b. Buffalo. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5½ x 8 x 11½. *u* Tax exempt. *w* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. § F.o.b. plant.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 100 lb. cases In oil *w*	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 55-lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$18.00	$28.625	$1.75	$2.70	$1.65	$2.06‡	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	17.75	28.25	2.25	3.50	2.75	2.06	2.50	2.50	.55	36.00
Birmingham	18.00	28.625	4.40	4.82	....	3.05	3.00	3.00	.48	42.00*ee*
Boston	17.75	28.25	....	....	....	....	....	2.75‡*q*	....	34.00
Chicago	17.75	28.25	....	....	....	2.47½*s*	2.67½*s*	2.67½*s*	35.00‡*bbs*	38.00‡
Cincinnati	17.75	28.25	....	....	....	2.44‡	2.54‡*o*	2.54‡*o*	.35*y*‡	42.00‡
Cleveland	17.75	28.25	3.00	3.00*a*	3.00	2.44	2.54*o*	2.54*o*	.32*y*	38.00
Dallas	18.00	29.00	....	4.05	....	3.50*q*	3.75*q*	4.35*q*	.36	46.00
Denver	18.25	28.75	2.88	4.38	2.63	3.20*o*	3.13*o*	2.54*o*	.41*ff*	40.00
Detroit	17.75	28.25	3.24	2.72	3.60	2.32	2.41	2.41	....	36.00
Kansas City	17.75	28.375	2.40*q*	3.35*q*	....	....	....	....	.36*y*	
Los Angeles	17.75	28.50	2.80	3.75	3.50	2.41	1.91*e*	*k*	.45	*k*
Minneapolis	17.75	28.375	....	....	....	2.32*ddd*	2.41*hddd*	2.41*hddd*	.336*ddd*	35.00*rddd*
Montreal	.....	25.65	3.25*t*	4.20*t*	3.62*t*	3.25*t*	3.00*ff*	3.00*ff*	.73*t*	2.60*kt*
New York	17.75	28.25	3.45*y*	....	3.45*y*	2.32	2.41*o*	2.41*o*	.34*s*	35.00
Philadelphia	17.75	28.25	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	17.75	28.25	2.00	2.40	1.90	3.00	3.10*o*	3.10*o*	.37	40.00
St. Louis	17.75	28.25	....	....	....	2.23	2.413*h*	2.413*h*	.36	36.00
San Francisco	17.75	28.50	1.80	2.75*n*	1.35	2.27	3.30*aa*	....	.38*y*	....
Seattle	17.75	28.75	2.95*m*	2.95*m*	....	3.23*mjcc*	3.24*kmcc*	....	.49*mcc*	48.25*jmcc*

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 *q* ft. *g* 55 gal. drums. *h* Per oil. 65 lb. Net carload lot prices: Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* May, 1941 price. *o* Per 60-lb. roll. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* ASTM Spec. D266-41. Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *z* Mineral surfaced. *y* 55-gallon container. *aa* Approximate cost per 100 lbs. *bb* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt, in 100 lb. package. *ff* 5-gal. drums.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Heavy Const
Atlanta	$2.50	$1.775	$2.00	$2.00	$2.00	$2.00	$2.00	$0.85	$0.95
Baltimore	3.00	2.25	2.40	2.20-2.40	2.25	2.25	2.25	1.25	1.25
Birmingham	2.50	1.90	2.15	1.75	2.20	2.25	2.25	1.00	1.10
Boston	2.625	2.25	2.40	2.60	2.50	2.50	2.45	1.65	1.65
Chicago	2.40	2.35	2.40	2.35	2.40	2.425	2.35	1.70	1.70
Cincinnati	2.50	2.20	2.35	2.50	2.375	2.375	2.35	1.46	1.475
Cleveland	2.375	2.325	2.375	2.25	2.375	2.525	2.375	1.725	1.725
Dallas	2.50	2.25	2.25	2.25	2.125	2.00	2.375	1.075	1.275
Denver	2.25	2.10	2.00	2.15	2.50	2.41	2.40	1.40	1.35
Detroit	2.50	2.20	2.40	2.40	2.50	2.60	2.40	1.575	1.575
Kansas City	2.60	2.15	2.30	2.375	2.75	2.30	2.395	1.575	1.475
Los Angeles	2.625	2.0375	2.30	1.9875	3.125	2.40	2.50	1.4875*	1.4875
Minneapolis	2.25	2.05	2.175	2.00	2.35	2.21*	2.25	1.45	1.45
New Orleans	2.50	1.875	2.25	2.125	2.00	2.30	2.25	1.025	1.025
New York	3.20*b*	2.75*b*	3.00	3.00	3.20*b*	3.00*a*	2.75*b*	1.70	1.70
Philadelphia	3.00	2.34-2.40	2.65	2.50 *	3.00	2.75-3.00	2.75	1.25	1.55
Pittsburgh	3.00	2.50	2.50	2.65	2.625	2.575	2.50	1.50	1.750
St. Louis	2.75	2.45	2.425	2.55	2.50	2.50	2.50	1.50	1.40-1.65
San Francisco	2.8125	2.16	2.40	2.125	2.25	2.50	2.375	1.525	1.525
Seattle	2.495	2.195	2.395	2.33	2.495	2.395	2.50	1.795	1.83
Montreal*	1.40	1.25	1.30	1.20	1.40	1.35	1.11	.94	.88

a 6 hr. day. *b* 7 hr. day. * Cost of living bonus now included in basic wage.

MEXICO CITY PRICES

In Pesos, f.o.b. City		Apr. '49	May '49
Common Wages—Building (8 hr. day)	av. per hr.	.57	.57
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.75	.75
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.25	1.25
Bricklayers (8 hr. day)	av. per hr.	1.25	1.25
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes 3"-15" x 12 meters	per ton	1,000.00	1,000.00
Reinf. Steel, Corr. Rods ⅜" x 12 meters	per ton	1,200.00	1,200.00
½" x 12 meters	per ton	1,100.00	1,100.00
⅝" x 12 meters	per ton	1,100.00	1,100.00
¾" x 12 meters	per ton	1,100.00	1,100.00
⅞" x 12 meters	per ton	1,100.00	1,100.00
1" x 12 meters	per ton	1,100.00	1,100.00
Gravel, truck load of 3½ cu. meters Blue Gravel	per tr. load	32.00	32.00
Rose Gravel	per tr. load	32.00	32.00
Cement, Std. Port. (Tolteca)	per ton	115.00	115.00
Lumber Mex. Sacred Fir (Oyamel)	per M ft.	375.00	375.00
1st Class Pine	per M ft.	750.00	750.00
2nd Class Pine	per M ft.	450.00	450.00

ENR Skilled Average: Bricklayers, Carpenters, Ironworkers) $2.394. **ENR Common Average:** $1.441

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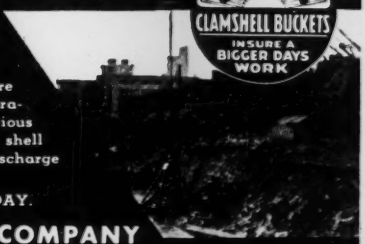

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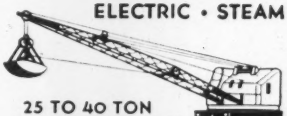

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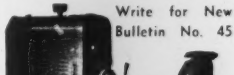

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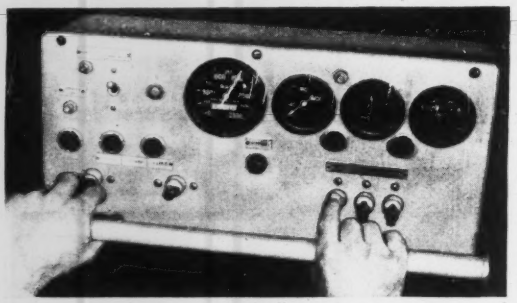
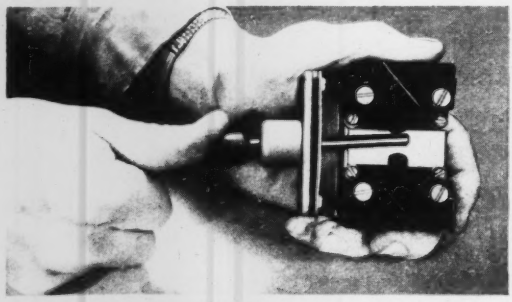
Electrically

New LeTourneau Scraper Moves 16-ton Loads at Touch of a Button



Control panel of LeTourneau's Model "C" Tournapull; a fingertip movement instantly applies power to motors which steer the vehicle, operate hoist, apron or tailgate.



Two General Electric switchettes make up switch assembly on control panel, above. Other G-E switches limit travel on steer, hoist, apron and tailgate motions by cutting power at the proper instant, eliminating stresses and strains.

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GENERAL ELECTRIC

CONSTRUCTION REPORTS-Second Section

Third Section Construction Reports on page 145

WATER SUPPLY

BIDS ASKED

June 13

Conn., Newington — State, Raymond S. Thatcher, comptroller, State Capitol, Hartford, c. i. watermains, Cedar Crest Sanatorium B/A-H-46.

Pa., North East—At office H. Lewis Willer, boro secy., water filtration plant addns., incl. mixing chambers alterations and equip., constr. sedimentation tank, 2 filter beds with piping and equip., electric wiring, boiler and other misc. items. Plans deposit $20. Hill & Hill, 21 E. Main St., engrs.

June 15

Ga., Valdosta—City, 15,370 lin. ft. 2-to 8-in. c.i. pipe, 7 hydrants, ext. Smith & Gillespie, P. O. Box 1048, Jacksonville, Fla., engrs.

Pa., Phila.—Dpt. P. Wks., Bureau of Water, City Hall Annex, preliminary treatment plant, appurtenances at Queen Lane Filter Plant, incl. constructing concrete basins, chemical bldg., substructure conduits, shafts, sewers and appurtenant structures, furnishing and installing mixing and sludge collecting equip., meters, valves, piping, sluice gates, etc., 126-WW-1. Plans deposit $25. CD 11/24/44—ENR 12/14/44.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, Queen Lane Filter Plant, appurtenances, WWI-449, approx. $28,000; watermains in Baltimore, University, Woodland and Park Aves., WWI-428, approx. $75,000; watermains in Welsh and Krewstown Rds., WWI-451, approx. $50,000; watermains in Clover St., WWI-448, approx. $28,000; watermains in Friendship St. and various other locations, WWI-427, approx. $28,000. Elbert J. Taylor, Water Bureau Chief. CD 11/24/44—ENR 12/14/44.

S. C., Spartanburg—City, filtration plant addn. Plans deposit $20. Wiedeman & Singleton, P. O. Box 1878, Atlanta, Ga., engrs.

June 16

Conn., Hartford—Metropolitan Dist. Water Bureau Rd. Contr. & Supply, 650 Main St., at 115 Broad St., 2 rein.-con. covered reservoirs, Wickham Hill, 117 ft. sq. 23½ ft. deep, 22,000 cu. yd. earth excavating and refill, 4,600 cu. yd. concrete masonry, 465 tons rein. forcing-steel, 2½ m. g. capacity each. East Hartford, Contr. 156. Plans deposit $10. CD 10/17/47—ENR 10/30/47.

✦N. M., Los Alamos—U. S. Atomic Energy Comm., Los Alamos, 3 mi. 6 and 8-in. effluent lines, $75,000; 3.6 mi. 14 and 12-in. water-mains, $100,000; booster station, two 1 m. cal. steel standpipes. Approx. $350,000. Inv. 291-49-149.

June 20

✦Tex., Camp Hood (P. O. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, c.i. waterlines, facilities, $40,000. Rejected bids May 3, c.i. waterlines, fire plugs, appurtenances, L. B. **$30,261**; elevated steel water tank and tower, L. B. **$21,700**. CD 5/11—ENR 5/19, under LB.

June 22

✦Tex., Austin—U. S. Eng., 606 Santa Fe Bldg., Galveston, c.i. waterlines, facilities for housing project area, $50,000.

✦Tex., Camp Hood (P. O. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, water-lines facilities, Inv. No. Eng-41-243-49-295, $40,000. CD 5/16—ENR 5/26.

LOW BIDDERS

Mass., Boston — Commonwealth of Mass., Metropolitan Dist. Comm., 20 Somerset St., Boston, May 26 Contr. 161, furnishing, laying water pipes, Stoneham and Melrose, from Demos Bros., Inc., 1709 Eliot Blvd., Springfield, **$389,405**. CD 5/12—ENR 5/19.

CONTRACTS AWARDED

Tex., El Paso—City, City Hall, water treatment plant to Rob E. McKee, P. O. Box Drawer 562, **$656,359**. Bids 5/19. CD 5/2—ENR 5/5.

SEWERS, WASTE DISPOSAL

BIDS ASKED

June 14

D. C., Wash.—Director Sanitary Engineering, District Bldg., 14 St. and Pennsylvania Ave. N. W., Zone 4, main Sewage Pump. 2, sewage treatment plant. Plans deposit $10.

About June 15

Kan., Garden City—City, City Hall, sanitary sewers, part lateral sys. $60,000. Seth Kingman & Assoc., Garden City, archts. Walter Jennings, Garden City, engr.

June 15

Neb., Madrid—City, City Hall, sanitary sewers, $62,766. Henningson Eng. Co., Standard Oil Bldg., Omaha, engr.

June 16

D. C., Wash.—Director Sanitary Engineering, District Bldg., 14 St. and Pennsylvania Ave. N. W., Zone 4, stormwater and sanitary sewers between New York Ave. and W St., vicinity 15 St. N. E., adv. ENR 6/9.

Tex., Hillsboro—City, sewage disposal plant, $75,000. Plans deposit $10. Extended date.

F. J. Von Zuben, 1606 Mistletoe Blvd., Fort Worth, engr. CD 5/18.

June 20

✦Tex., Camp Hood (P. O. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, sanitary sewers for apartment housing zone, $70,000. Bids May 3, rejected. L.B. **$53,400**, sewage treatment plant L.B. **$35,728**. CD 5/11—ENR 5/19, under LB.

June 22

✦Tex., Austin—U. S. Eng., 606 Santa Fe Bldg., Galveston, sanitary sewers for new housing, $70,000.

✦Tex., Camp Hood (P. O. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, sanitary sewers, Inv. No. Eng-41-243-49-295. $65,000. CD 5/16—ENR 5/26, under LB.

June 23

Ore., Portland—City, City Hall, Outfall Unit, 1, approx. 2 mi. 8 ft. concrete sewer from proposed treatment plant north of Vanport across Hayden Island to Columbia River. Plans deposit $25. Ben S. Morrow, City Hall, city engr.

LOW BIDDERS

Ala., Prichard—City, May 24, sanitary sewers, from George Consolidated Contractors, c.o Ladd Eng. Co., Wood Bldg., Ft. Payne, engr., **$379,905**. CD 5/18.

CONTRACTS AWARDED

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., raw sewage pump. plant, and grit chambers of Alvarado-Niles Rd. Contr. 1694 Pomona St., Crockett, **$572,388**. Bids 5/11. CD 5/17—ENR 5/19, under LB.

●Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan Ave., West Southwest Sewage Treatment Works, Div. N. Stickney, to General American Transportation Corp., 135 S. LaSalle St., **$1,062,157**. CD 4/26—ENR 4/28, under LB.

●N. Y., Tonawanda—Town, Municipal Bldg., Kenmore, storm drains, Sect. F, approx. 7,500 ft. 787 ft. concrete conduit with special structures, manholes, appurtenances, to A. K. Wikstron, Inc., Skaneateles, **$989,810**; Sect. H, approx. 4,400 ft. 54-to-78-in. rein.-con. pipe with special structure, manholes, appurtenances and Sect. J, approx. 1,935 ft. 24-to-42-in. rein.-con. pipe, with special structures, manholes, appurtenances, to Herbert F. Darling, 131 California Dr., Williamsville, Zone 21, **$371,770**. CD 4/28—ENR 5/5.

BRIDGES

BIDS ASKED

June 17

✦Georgia—U. S. Eng., P. O. Box 1169, Mobile, 7 Ala., bridge over Little River at Cherokee Mills, Cherokee Co., Serial No. Eng-01-076-49-145. Extended date. CD 4/26—ENR 4/28.

June 21

✦Georgia—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., bridge and approach roads, Allatoona Creek, Bartow Co., Serial No. Eng-01-076-49-169. Extended date.

June 24

✦Washington—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, bridge over Okanogan River on access hy. to Chief Joseph Dam, Serial No. Eng-45-108-49-182, Brewster.

LOW BIDDERS

Iowa—State Hy. Dpt., Ames, May. 24, bridge, F942 (1), Bremer Co., from D. N. and M. R. Taylor, Decorah, **$82,160*****bridge F67 (9), Hamilton Co., from Welden Bros., Iowa Falls, **$109,058*****bridge F64 (8), Group 1, Jasper Co., from Schroyer Contr. Co., Newton, **$59,939*****bridge S642 (3), Group 2, Marshall Co., from A. Olson Constr. Co., Waterloo, **$80,917*****bridge ERS 4 (7), Warren Co., from Ben Cole & Son, Ames, **$62,974*****bridge ERF 1 (12), Group 2, Warren Co., from Iowa Bridge Co., Des Moines, **$108,991**. CD 5/12—ENR 5/19.

Kentucky—State Hy. Dpt., Frankfort, May 27, bridge and b. conc. 0.473 mi. approaches Floyds Fork, Louisville-Shelbyville Rd., FI 117 (19), SP 56-58, Jefferson Co., from Kelly Contg. Co., Pincastle Bldg., Louisville, **$333,-248**. CD 5/11—ENR 5/19.

New Jersey—Spencer Miller, Jr., comr. State Hy. Dpt., Trenton, May 26, wid'n underpass of Reading R. R. at Parkway Ave., FASP No. S-93 (1), Ewing Twp., Mercer Co., from Construction Service Co., Lincoln Blvd., Middlesex Boro, Bound Brook, **$183,125**. CD 5/11—ENR 5/19; open grid steel flooring for Route 49 Maurice River Bridge, Millville, Cumberland Co., from Kolyn Constr. Co., 150 E. State St., Trenton, **$106,282**. CD 5/6—ENR 5/12.

Pennsylvania — Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg, const. substructure and superstructure of bridge to carry Philadelphia Exten. of Pennsylvania Turnpike over Swatara Creek, incl. bridge Swatara Creek Channel, Turnpike Sect. 23-A-1, Swatara Creek Bridge 0.117 mi. part of Philadelphia Exten., in Lower Swatara and Londerderry Twps., Dauphin Co., from John H. Eckenhoff Co., Lancaster, **$442,712**. CD 5/11—ENR 5/19.

✦Tennessee—P. Rds. Admin., Arlington, Va., Apr. 19, 5 bridges, Cade Cove Rd., Great Smokies National Park, Blount Co., from Gatlinburg Constr. Co., Gatlinburg, **$117,291**. CD 4/31—ENR 4/7.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, railroad overhead consisting of steel beam spans supported on rein.-con. bents and abutments on rein.-con. piles on East Shore Freeway at High St., Alameda Co., to A. Soda & Son, 5251 Grove St., Oakland, **$684,931**. Bids 3/30. CD 4/5—ENR 4/7, under LB.

New York—Bureau Contracts & Accounts, P. Wks., Albany, grade separation structure to carry New York Central R. R. tracks over Gooding St., Lockport, Niagara Co., to Metzger Constr. Co., 429 Carlton St., Buffalo, **$525,183**. Bids 4/20. CD 4/22—ENR 4/28, under LB.

STREETS AND ROADS

BIDS ASKED

June 14

Minn., Gaylord—Sibley Co., W. C. Oldenburg, aud., Gaylord, grav. 5.5 mi. between 1.5 mi. north of Arlington and 0.5 mi. south of North Co. line S.P. 72-502-02 (SAR 10) and S.P. 72-510-01 (SAR 9) Minn. Proj. S 49 (10); grav. 1 mi. Rush River, and approaches to Rush River Bridge, S.P. 72-514-03 (SAR 8), Minn., Proj. S 265 (2). Plans deposit $2.50 and $0.55. G. Anderson, Gaylord, co. engr.

June 15

✦Va., Williamsburg—Pub. Wks. Office, Fifth Naval Dist. U. S. Naval Base, Norfolk, Zone 11 resurf. roads at Cheatam Annex, Naval Supply Center, Spec. 22699. Plans deposit $10.

June 21

Minn., Faribault—Rice Co., C. L. McCarthy, aud., Faribault, crushed rock surf. 3.4 mi. between west co. line and County Aid Rd. ss. S. P. 66-593-02 (SAR 10), Minn. Proj. S 74 (4), $50,000. Plans deposit $1.10. G. Clark, co. hy. engr.

Minn., Mankato—Blue Earth Co., R. E. Lee, aud., Mankato, grav. 4.2 mi. between TH 83 in St. Clair and East Co. line, S. P. 07-518-01 (SAR 15), Minn. Proj. S 396 (1); 3.1 mi. between South Co. line and TH 30. Approx $50,000. Plans deposit $1.10 and 75c. R. C. Deegan, co. engr.

Minn., Morris—Stevens Co., E. F. Anderson, aud., Morris, grading 6.5 mi. between 4.5 mi. south of T. H. 28 at Chokio and south county line, S. P. 75-501-01 (S. A. R. 4), Minnesota Proj. S 283 (2). Plans deposit $1.60; gray. 4.7 mi. between S. A. R. 10 and Hancock, S. P. 75-5.6-03 (S. A. R. 1), Minnesota Proj. S 323 (5). Plans deposit $.50; gray. 0.7 mi. between T. H. 9, Donnelly and S. A. R. 12, S.P. 75-504-01 (S. A. R. 2), Minnesota Proj. S. 362 (4); grav. 4 mi. between 4 mi. west of Donnelly and S. A. R. 3, Donnelly, S. P. 75-511-01 (S. A. R. 12), Minnesota Proj. S. 428 (1); grav. 4.8 mi. between 4.8 mi. west of T. H. 9 and T. H. 9 north of Donnelly S. P. 75-512-01 (S. A. R. 8), Minn. Proj. S 427 (1); grav. 3 mi. between S. A. R. 3 north of Donnelly and S. A. R. 8, S. P. 75-513-01 (S. A. R. 6), Minnesota Proj. S. 427 (2). Approx $50,000. J. DuPont, co. engr.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $25,000; other public works $50,000; industrial buildings $68,-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	

Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

✦	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

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LOW BIDDERS

California—State Div. Hys., Sacramento, May 25, c. conc. on cement treated subgrade, plant mix on crushed rock surf. 7.8 mi. between 1 mi. south of Tipton & Tulare Airport, Tulare Co., from N. M. Ball Sons, Box 430, Berkeley, **$663,229.**

●**Iowa**—State Hy. Dpt., Ames, May 24, rolled stone base, heavy bit. surf. tr. 5.861 mi. F 650 (2), Lee Co., from Cameron, Joyce & Co., Keokuk, **$113,776*****pavement w/d'n. resurf. 13.212 mi. F 64 (6), Jasper Co., and 9.309 mi. F 206 (9), Polk Co., from Hargrave Constr. Co., 2424 Bever St. S. E., Cedar Rapids, **$545,989** and **$333,486** respectively***grading 13.212 mi. F 64 (9), Jasper Co., and 9.309 mi. F 206 (11), Polk Co., from Mickle & Ross Constr. Co., Newton, **$118,631** and **$98,786** respectively***grading 11.637 mi. S. 453 (3), Johnson Co., from Eben Van Dusseldorp, Colfax, **$65,497*****grading 5.861 mi. F 650 (2), Lee Co., from Ralph Greer & W. L. Groesbeck, 312 Masonic Temple Bldg., Des Moines, **$51,970*****paving 16.53 mi. F 464 (4), Adair and Cass Counties, and 2.313 mi. F 915 (1) Montgomery Co., from Booth & Olson, Inc., 579 Insurance Exchange Bldg., Sioux City, **$809,482** and **$119,916** respectively***paving 1.951 mi. U 4 (19), Clinton Co., from Quad City Constr. Co., Rock Island, Ill., **$188,259***** paving 0.848 mi. F 260 (4), Marion Co., from Central Constr. Co., Indianola, **$125,979*****paving 3.42 mi. UI 88(3), Woodbury Co., from Western Contg. Co., 400 Robinson Bldg., Sioux City, **$202,420.** CD 5/12—ENR 5/19.

Kentucky—State Hy. Dpt., Frankfort, May 27 traffic bound surf. 4.896 mi. Jeffersonville-Stanton, S. 447(3), S. 577 (39-20), Montgomery and Powell Counties, from A. W. Walker & Con., Mt. Sterling, **$174,621*****bit. surf. Class C-1 and rock asph. seal 10.869 mi. SP Group 38 (1949), Ballard Co., and bit. surf. Class F rock asph. seal, 12.263 mi. SP Group 39 (1949), Logan Co., from Southern Quarries & Contr. Co., 150 E. Broad St., Columbus, 15, O., **$60,518** and **$100,047** respectively***bit. surf. Class C-1 and A-2 seal, 26.193 mi. SP Group 40 (1949), Daviess and Ohio Counties, from State Contg. Co., Inc., Hartford, **$64,516*****bit. surf. Class F and A-2 seal 16.685 mi. SP Group 42 (1949), Perry Co., from Hinkle Contg. Co., Paris, **$90,778*****bit. surf. Class I felsic aggregate 29.26 SP Group 45 (1949), Boyd and Lawrence Counties, from Middle States Bituminous Corp., Ashland, **$52,147*****bit. surf. Class C-1 and A-2 seal, limestone 17.1 mi. gravel 21.449 mi. SP Group 46 (1949), Morgan and Wolfe Counties, from Independent Contg. Co., Louisville, **$94,393*****bit. surf. Class F 12.51 mi. RH Group 2 (1949), Madison Co., from Allen Cudell Co., Inc., Winchester, **$63,882*****bit. surf. Class I, 18.32 mi. RH Group 4 (1949), Jefferson Co., from Breslin Constr. Co., 3801 S. Rhodes St., Louisville, **$120,901*****reconstruction and bit. surf. 3.227 mi. Pique-Kentontown Rd., RS 101-181, Mt. Olivet-Abigal Rd., RS 101-1 1, and Mt. Olivet-Bridgeville Rd., RS 101-81, Robertson Co., and bit. surf. Class C-1 and A-2 seal limestone and grav. aggregate, 26.55 mi. RH (1949), Campbell and Kenton Counties, from Eaton O-I Works, Inc., Covington, **$54,033** and **$52,739** respectively***traffic bound limestone 7.188 mi. Milford-Newtown, RS 12-86, Bracken Co., from Capitol Excavation Co., Augusta, **$66,860***** local bank of creek grav. 3.5 mi. Cranks Creek Rd., RS 48-408, Harlan Co., from Lovell & Hart Constr. Co., Lexington, **$66,118*****traffic bound limestone 4.79 mi. New Castle-Bethlehem Rd., RS 52-387, Henry Co., and bit. surf. Class C-1, 19.162 mi. Shannon Germantown Rd., Mt. Gilead Rd., Fernleaf-Minerva Rd., RS 81-275, 81-295 and RS 81-315, Mason Co., from R. B. Tyler Co., 1446 Lexington St., Louisville, **$51,805** and **$111,596** respectively***river grav. New Castle-Bethlehem Rd., RS 52-387, Henry Co., from Hicks-Freeman, Prospect, **$54,044*****local grav. 6.8 mi. Maddox Ridge Rd., RS 52-427, Henry Co., from John Harmon, Bedford, **$51,392*****traffic bound limestone 12.879 mi. RS 52-427 Maddo Ridge Rd. RS 52-387 New Castle-Bethlehem Rd., Henry Co., and traffic bound and traffic bound surf. 6.78 mi. Big Hill-Irvine Rd., (Red Lick Creek Rd.), RS 73-331, Madison Co., from Ambrosius Constr. Co., Strand Theatre Bldg., Louisville, **$133,172** and **$61,369** respectively*** traffic bound limestone 5.232 mi. Wolf Creek Rd., RS 118-820, Whitley Co., from Cedell Constr. Co., Winchester, **$69,558.** CD 5/11—ENR 5/19.

●**Maryland**—State Hy. Dpt., Baltimore, grading, drainage, surf. 5.73 mi. State Rt. 282, beginning at Cecilton and exten. northeasterly via Warwick to Delaware State line, F. A. P. S. 262 (2), Contr. CE 1-2-201, Co., from United Paving Co., Elkton, **$324,710*****grading, drainage, surf. 5.49 mi. dual hy. along U. S. Rt. 40, F. A. P. Fl 449 (7), Contr. HO 234-1-315, Howard Co., from T. E. Rutter Corp., 426 W. York St., Norfolk, Va., **$1,689,389.** 5/18 ***grav. surf., bit. stabilized base course 4.205 mi. Sect. State Rt. 242, Contr. SM 286-4-515, St. Marys Co., from F. P. Asher, Jr. & Sons, Inc., West Ext., Annapolis, Alt. A **$300,306.** Alt. B **$298,046.** Alt. C **$298,046.** CD 5/11—ENR 5/19.

Md., Baltimore—Mayor & City Council, City Hall, Baltimore, May 25 sheet asph. resurf. streets, Contr. 981, from Arundel Constr. Co., 4420 E. Eager St., **$123,827*****Contr. 982, from Baltimore Asphalt, Block & Tile Co., 1320 N. Monroe St., **$142,407*****Contr. 983, from P. Flanigan & Sons, Inc., 2405 Loch Raven Blvd., **$140,986*****bit. conc. streets, Contr. 984, from American Paving & Contg. Co., 2525 Loch Raven Blvd., **$161,764*****c. conc. streets, Contr. 986, from Property Sales Co., 900 Court Sq. Bldg., **$62,223.** CD 5/18.

Minnesota—State Hy. Dpt., St. Paul, May 20 grading, bridges, S. P. 5409-06 (TH 81-175) and S. P. 6012-05 (TH 81-175), F. 939 (5), from Mooch Bros., Moorhead, **$186,673*****grading, paving, S. P. 8207-08 (TH 61-1) F. I. 322 (4), from Woodrich Constr. Co., Hopkins, **$134,603*****hot asph. concrete surf. S. P. 6918-06 (TH 53) F. I. 371 (15), from E. W. Coons, Inc., Hibbing, **$72,536*****grading S. P. 6406-04 (TH 93-93) and S. P. 0807-02 (TH 93-93), and grading, S. P. 1706-01 (TH 68-88) F 308 (3) and S. P. 4216-02 (TH 68-68) and S. P. 4216-04 (TH 61-68) F 214 (5), from Berghuis Constr. Co., Clara City, **$51,452** and **$106,438** respectively, CD 5/4—ENR 5/12.

New Jersey—Spencer Miller, Jr., comr. State Hy. Dpt., Trenton, May 26, resurf. Route 43, White Horse Pike approach to seashore resorts, Atlantic Co., from Eastern Eng. Co., 4 N. North Carolina Ave., Atlantic City, **$292,395*****wid'n Absecon Blvd., Rt. 56, Sect. 2, Atlantic Co., from Albert E. Barrett, 530 New York Ave., Trenton, **$133,782*****Park Ave. F.A.S. S-11341, Middlesex Co., from Perelli Contg. Co., Inc., 1633 Hamilton Ave., Trenton, **$113,623.** CD 5/6—ENR 5/12.

North Carolina—State Hy. Dpt. & Pub. Wks. Comn., Raleigh, May 31, bit. or h.-conc. 9.76 mi. N. S. Rte. 26 from point southeast of Marion at intersections at State Prison Camp 505, southeast to U. S. 64, Proj. 8484, McDowell Co., CD 5/20—ENR 5/26, and STBC, bit. or sand asph. surf. course 9.51 mi. from point U. S. 421 in Goldston, northeast along existing county road to point south of Pittsboro, Proj. 6.162, Chatham Co., CD 5/26, from E. H. Hines Constr. Co., Inc., Box 924, Greenwood, S. C., **$198,664** and **$122,031,** respectively*** c.conc. 2.73 mi. from point in Winston-Salem at U. S. 421 and east to intersection with U. S. 421, Proj. 7408, Forsyth Co., from Wm. F. Rowe & Co., 540 Reynolds St., Augusta, Ga., **$227,116.** CD 5/20—ENR 5/26***stab. base, bit. or sand asph. surf. 7.3 mi. from point 5.5 mi. south of Robbins to Mitch ners Cross Roads from Mitcheners Cross Roads to Louisburg, Proj. 4-191, Franklin Co., from Propst Constr. Co., Inc., Concord, **$76,368*****bit. or h.-con. surf. 7.32 mi. at intersections of county road and U. S. 321 at Dallas, 4.5 south of Gastonia to South Carolina State Line Betterment, Sect. 9-7 81-43, Gaston Co., from Dickerson, Inc., Box 393, Monroe, **$54,601*****grading 9.71 mi. from point on U. S. Rte. 264 near Swan-quarter east to point on U. S. 264 at Lake Comfort, Proj. 2-301, Hyde Co., from J. S. Hill Constr. Co., Washington, **$105,373***** STBC, bit. or sand asph. surf. 2.85 mi. from point on N. C. 41 approx. 8 mi. south of Fairmont southeast to beginning mi. south of Fairmont, southeast to beginning of bridge over Lumber River at Robeson-Columbus County line, Proj. 6.451, Robeson Co., from A. A. Screeden's Sons, Wilmington, **$182,937,** CD 5/23—ENR 5/26***graffic bound macad. w'd'n, bit. conc. binder and surf. course, concrete curb and gutter 6171 mi. Part 1, N. Green St. from Varines Ave. to H.P.T. & D. Spur Track, Part 2, W. Green St. from Jacobs to Willow-brook Sts.; Part 3, E. Green St. from Wrenn to Whitcoak Sts. (High Point), Proj. 5291, Guilford Co., from Thompson-Arthur Constr. Co., Box 1197, Greensboro, **$77,662.** CD 5/26.

●**Oregon**—P. Rds. Admin., Broadway and Oak Bldg., Portland May 26, surf. 21 mi. Willamette Hy., 43 mi. east of Eugene, Proj. 21-E5-(3), Hi. 14, 15, K5, L2, Lane Co., from Peter Kiewit Sons Co., Box 491, Longview, Wash., **$618,289.** CD 5/12.

Pennsylvania—State Hy. Dpt., Harrisburg, May 27, macad. surf. 0.58 mi. T.R. 146, West Goshen Twp., Chester Co., from J. E. Eckman, Atglen, **$58,799*****macad. surf. 5.67 mi. U. S. 219, Lafayette Twp., Lewis Run Boro. exten. 3 rein.-con. bridge over Lewis Run, Maxam Run and 5 Lewis Brook, between Eldred Twp. and Bradford, M'Kean Co., from Allegheny Asphalt & Paving Co., Bingham and 8 Sts., Pittsburgh, **$397,381*****c.conc. 0.54 Rura Rt. 48036, Bangor Boro, Northampton Co., from Charles Rebe, Lansford, **$86,588.** CD 5/26—ENR 5/12.

●**Texas**—State Hy. Comn., Austin, May 25, grading structures 14.815 mi. Hy. 155 and U. S. 59, F-435 (6) and F-1090 (1), Cass Co., from E. B. Hill, Box 606, Sherman, **$464,501*****flexible base, h. conc. 1.527 mi. Hy. 207, Loop from Junction State Hy. 146 north of Mont Belvieu to junction State Hy. 146 south of Mont Belvieu, Control No. C 788-10-1, Chambers Co., from Hollbrook & Graves, Dayton, **$95,975*****flexible base, prime and single asph. surf. tr. 10.209 mi. H. FM 854 from F. M. 343 near Alto to U. S. Hy. 69, in Alto, Control No. 1150-4-1, FP No. S-1175 (4), Cherokee Co., from M. E. Ruby, San Marcos and W. L. Barnes, Austin, **$113,429*****flexible base, h. conc. 7.025 mi. Hy. 200, F-1051 (8), Colorado Co., from T. C. Cage, 607 Travis Bldg., San Antonio, and Dean Kelchner, Eagle Lake, Austin, **$100,955*****hot mix h. conc. on Hy. 352, C-436-1-10, Dallas Co., from Uvalde Constr. Co., Box 3027, Dallas, **$54,322*****flexible base, hot mix h. conc. 16.066 mi. Hy. FM 76, S-413 (2) and (3), El Paso Co., from Hugh McMillan, P.O. Box 1127, El Paso, **$116,125*****flexible base and double h. conc. 13.246 mi. Hy. F.M. 785 and 786 V. 740-2-1 and V. 1128-2-1, Floyd Co., from Cooper & Woodruff, 1203 Dallas Natl. Bank Bldg., Dallas, **$94,618*****flexible base and double-asph. surf. tr. 1.468 mi. Hy. 146, C 389-7-5, Galveston Co., from Harrison Eng & Constr. Corp., 4638 Mill Creek Parkway Kansas City, Mo., **$70,617*****c. conc. 3.652 mi. Hy U. S. 75 and State 6, F. I. 466 (16), Galveston Co., from Gulf Rithibline Co., P. O. Box 2095, Houston, **$829,863*****flexible base,

(Continued on page 138)

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(Continued from page 136)

b. conc. 11.851 mi. Hy. 29, F. 1026 (5), Goliad Co., from J. M. Dellinger, Inc., Box 1356, Corpus Christi, **$112,833*****grading, structures, roadbed tr. and c. conc. 3.067 mi. Hy. U. S. 175, F. 136 (8), Kaufman Co., from Austin Road Co. and Austin Bridge Co., Box 1590, Dallas, **$144,155*****flexible and single asph. surf. tr. 5.531 mi. Hy. P. M. 1043 and 267, S. 1271 (1) 2 and C. 538-1-7, Knox Co., and cement stab. and double asph. surf. tr. 12.884 mi. H. 305, C 582 and 1-2 and 6 and 5, Lipscomb Co., from C. Hunter Strain, P. O. Box 1057, San Angelo **$56,631** and **$128,700** respectively***hot mix b. conc. 29.012 mi. U. S. Hy. 75, F 559 (7) and F 483 (3), Leon Co., from Gaylord Constr. Co., 806 Blodgett St., Houston, **$206,489*****flexible base and double asph. surf. tr. 6.581 mi. State, 158, C 467-43-4, Midland Co., and flexible base and single asph. surf. tr. 15.253 mi. Hy. FM 282 and 283, V. 798-1-2, Roberts Co., from Ernest Loyd, Box 1120, Fort Worth, **$74,817** and **$121,495** respectively***seal coat 78.875 mi. Hys. US 83, S. 287, 54, State 117 and 179, Ochiltree, Lipscomb, Hemphill Potter and Sherman Counties, from Ned R. Hoffman, 617 Fort Worth Club Bldg., Fort Worth, **$90,776*****flexible base duraco pavement 1.678 mi. Hy. U. S. 290 and State 159, Walker Co., from E. B. Derby & Co., Pharr, Tex., **$63,012*****flexible base and double asph. tr. 14.283 mi. Hy. U. S. 83 F-1-B (3), Webb Co., from Thomas Ratliff, Rogers, **$220,404*****w/d'n c. conc. 1.204 mi. Hy. US 277 and US 281, C 156-2-9, Witchita Co., from Wesley Hall, Brownswood, **$66,163.** CD 5/5—ENR 5/12.

Washington—State Hy. Dpt., Olympia, surf. stockpiling 2.981 mi. S.H. 3 and stockpiling S.S. Hy 3-K, Clarkston West E.R.P. ER-F-2(1), Unit 1, Asotin Co., from Curtis Sand & Gravel Co., P. O. Box 196, Spokane, **$83,796*****surf., stockpiling constr. rein.-con. girder bridge over Little Washougal River and constr. rein.-con. box culvert in Winkler Creek on 0.474 mi. S.S.H. 8-B, Clark Co., from Guy Norris, Green Bldg., Seattle, Zone 1, **$128,300*****non-skid seal tr. and bit. penetration manual, 45.55 mi. Hys. 1, 2, 5-D, 1-A, 1-D and 1-V, Kits Corner to Junction S.S.H. 1-Z, King, Pierce, Skagit, Island and Waitcomb Counties, from Western Asphalt Co., 309 W. 39 St., Seattle, **$92,120.** CD 5/12—ENR 5/19.

●†**Alaska**—P. Rds. Admin., Juneau, May 24, grading, surf. 54 mi. Sect. B-1, Glenn Hy. between Palmer and Copper Center, from S. Burch & Sons and Morrison Knudsen Co., Inc., 810 3 Ave., Seattle, Wash., **$2,164,521.** CD 5/16.

CONTRACTS AWARDED

●**California**—State Div. Hys., Sacramento, c. con. on cement treated subgrade and plant-mix on c. conc. surf. and untreated rock base 7.2 mi. between Mariposa Rd. south of Stockton and Calaveras River north of Stockton and between Wilson and New Route 4, Stockton, San Joaquin Co., to United Concrete Pipe Corp., Box 425, Baldwin Park, **$1,067,955.**

●**Minnesota**—State Hy. Dpt., St. Paul, to Herbison Constr. Co., Brainerd, grav. base and plant-mixed surf. S. P. 1919-07 (TH 165-101) and S. P. 7006-10 (TH 165-101), F. I. 915 (10) and S. P. 7006-04 (TH 165-101) F. I. 915 (9), **$189,062;** grav. base, bit. stab. S. P. 3604-20 (TH 11-11) F 400 (19), **$123,744;** gravel base and road mixed bit. surf. S. P. 1412-03 (TH 73-72), **$127,416*****to Mergen Bros., St. Cloud, plant mix bit. surf. Maintenance Dist. 2, **$98,726;** plant mixed bit. surf. S. P. 6604-08 (TH 19-100) S. P. 2501-05 (TH 19-100) S. P. 258-8-12 (TH 56-116), and S. P. 2502-11 (TH 19-100) **$175,442*****to J. Brown & E. Randin, Mankato, grav. base and road mixed bit. surf. S. P. 6930-14 (TH 73-163) and S. P. 6931-06 (TH 73-163), **$102,207;** grav. base and road mixed bit. surf. S. P. 6923-11 (TH 61-1), F. I. 171 (6), **$54,172*****to Red Wing Constr. Co., Rochester, grading S. P. 1109-06 (TH 64-193), **$129,526*****to L. Joyce, Rochester, grading S. P. 7404-02 (TH 30-82), **$99,567*****to McCree & Co., 918 New York Bldg., St. Paul, grav. base and plant mixed bit. surf. S. P. 6610-07 (TH 165-101) an S. P. 6611-06 (TH 165-101) F. I. 915 (11), **$270,521*****to C. O. Gustafson Belanger Bros. International Falls, grading, bridges S. P. 3606-12 (TH 11-158), **$67,727***** to J. W. Craig Co., 1814 N. E. California St., Minneapolis, grav. base, concrete base and plant mixed bit. surf. S. P. 8207-17 (TH 61-1), S. P. 3102-34 (TH 61-1), S. P. 1303-07 (TH 61-1) and S. P. 136306 (TH 611), F. I. 322 (3) and F. I. 2 (3), **$133,575.** Grand tot. 1 $1,766,-687. Bids 1/20. CD 5/4—ENR 5/12.

●**Mississippi**—State Hy. Dpt., Jackson, grav. surf. course, 2.292 mi. Co. Hy. between Bellfontaine and Spring Hill, F. A. S. P. S 175 (1), Webster Co., grading, drainage, struct. culverts and box bridge, 5.518 mi. unnumbered State Hy. between Summit and Meadville and U. S. Hy. 84, between Bude and Meadville, F. A. P. F 0150 (2), Contr. 1 and F 299 (1), Franklin Co., to Blount Bros. Constr. Co., Tuskegee, Ala., **$88,715** est. $75,500 and **$180,481** est. $240,000 respectively***bit. 6.738 mi. and bridge, U. S. Hy. 61, between Tunica and State line, F. A. P. F 1-3 (8), De Soto Co., to M. & W. Constr. Co., Memphis, Tenn., **$64,-262** est. $60,000***grading, drainage structures, culverts, bridges on 8.792 mi. unnumbered State Hy. between Milestone and Belzoni, F. A. S. P. S. 252 (3), Holmes and Humphreys Counties, to E. Swilley, North St. Bldg., and W. Wells, 524 Mitchell Ave., Jackson, **$236,-350,** est. $255,000***grading, drainage, structures, culverts and bit. surf. 9.51 mi. Co. Hys. between Amory and Parhams State F. A. S. P. S 284 (1), Monroe Co., to J. R. Mabard & Co., 1021 Heywood Ave., Memphis, Tenn., **$100,779,** est. $105,000***c. conc. 10.387 mi. State Hy. 3,

between Tutwiler and Marks, F. A. S. P. F 270, Tallahatchie and Quitman Counties, to Burdine Constr Co., Greenville, **$468,164,** est. $465,000. Grand total $1,138,751. Bids 5/24. CD 5/16.

Washington—State Hy. Dpt., Olympia, grading, draining 4.699 mi. Secondary State Hy. 2-F, Odair to Electric City, Grant Co., to Peter Kiewit Sons Co. Longview, **$894,226;** grading, draining, surf. 5.007 mi. Branch Rd. F.A.S. No. S-0405(1), Yakima Co., to J. D. Shotwell, Puget Sound Bank Bldg., Tacoma, **$79,771.** Bids 5/27, CD 5/12—ENR 5/19.

West Virginia—State Road Comn., A. L. Fleshman, secy., Charleston, macad. base, b. conc. and bridge 0.769 mi. Joe's Creek Relocation Rd., FAP F-288 (1), Boone Co., to Brown & Wright, Princeton, **$162,255***** macad. base, b. conc. and bridge 0.652 mi. U. S. Rte. 19, W. Va., Secondary Rte. 25 (Veterans Hospital) FASP S-508 (2), Harrison Co. to Kelley Constr. Co., Clarksburg, **$95,339***** traffic bound base 3.611 mi. Neptune-Belleville Rd. Proj. F-306 (7), Jackson and Wood Counties, from Boss & Ritchie, Inc., Ravenswood, **$225,901***** traffic bound base Type B (2.874 mi. W. Va. Rte 3 to Sec. Rte 44 Road, Sec. Rte. 40), FASPS-549 (1), Lincoln Co., to Odum Constr. Co., Huntington, **$66,618.** Grand total $550,142. Bids 5/24, awarded 5/27. CD 5/13—ENR 5/19.

Wisconsin—State Hy. Comn., Madison, grading, draining, base course 9.812 mi. Viroqua—Readstown Rd., U. S. Hy. 14 and 61, Contr. 1, Proj. F-08-2 (15) Vernon Co., to P. W. Ryan Sons, 363 S. Third St., Janesville, **$503,866.** Bids 5/24. CD 5/31—ENR 6/2, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

June 14

†Arkansas and Tennessee—U. S. Eng., P. O. Box 97, Memphis, 1, Tenn., casting 80,000 squares articulated concrete mattress at Helena, Ark. and 72,000 squares at Richardson Landing, Tenn., and del. 21,000 cu. yd. ready-mixed concrete into steel forms at Richardson Landing, Tenn. Serial No. Eng-40-041-49-146.

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, 1, Mo., levees, Prairie Du Rocher (Illinois and vicinity, Item H-B, (Edgar Lakes, Prairie Du Rocher & Modoc Drainage and Levee Districts) Randolph Co., Serial No. Eng. 23-065-49-129. Extended date. CD 5/27.

†Virginia—U. S. Eng., foot of Front St., Norfolk, bulkheads at North Landing and Lake Drummond, Norfolk Co., Inv. Serial No. Eng-44-110-49-186. Extended date. CD 5/25.

†Wisconsin—U. S. Eng., 428 Federal Bldg., Milwaukee, Zone 1, removing, disposing approx. 83,000 cu. yd. material other than ledge rock from shoals in Menomonee, Milwaukee and Kinnickinnic Rivers, Milwaukee Harbor, Serial No. Eng. 47-013-49-76.

June 16

†Minnesota—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul, Zone 1, Stage 2, channel imprv. Clearwater River, from 21 to 32 mi. east of Red Lake Falls, Serial No. Eng. 21-018-49-98. CD 5/20.

†Missouri—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, Zone 1, levees, Perry Co. Levee Dists. 1, 2 and 3, Proj. Item 1-C, Perry Co., Serial No. Eng. 23-065-49-136. CD 5/27.

June 17

†California—U. S. Eng., Wright Bldg., Sacramento, Burns Creek Dam, Merced Co.

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, 1, Mo., levees, left bank Mississippi River, Columbia Drainage and Levee Dist., Project Item LL-B, Monroe Co., Serial No. Eng. 23-066-49-137. CD 5/27.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 8, 75,000 cu. yd. semi-compacted earthwork, etc., Red River below Denison Dam Levees, Red River and Bayou Pierre Levee and Drainage Dist., Item R 273.6-266.0-R, Red River Parish, Serial No. Eng. 16-047-49-303.

†Missouri—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., Levee Unit 476-L, Part 1, left bank of Missouri River, Andrew Co., near Amazonia, Serial No. Eng. 23-028-49-218. Extended date. CD 5/20.

†Pennsylvania—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Zone 19, refacing Lock Walls, Lock 5, Monongahela River, Brownsville, Serial No. Eng-36-058-49-139.

†Va., Parkersburg—U. S. Eng., P. O. Box 2127, Huntington, Zone 18, pump, equip. installation, Local Protection Proj., Serial No. Eng-46-022-49-146.

June 23

†Minn., Minneapolis—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul, Zone 1, Stage 1, dam, Lower Lock and Dam, St. Anthony Falls; adv. ENR 6/9. CD 5/26.

Bids Asked

Tex., Houston—The Finger Interests, c/o Hiram and Aaron Finger, 3131 Calhoun Rd., excavation and drainage, 11 acre site on Gulf Freeway. $75,000. J. B. Dannenbaum, 2949 Main St., engr.

LOW BIDDERS

●†Illinois—U. S. Eng., 826 U. S. Court House & Custom House, St. Louis, 1, Mo., June 1, excavation canal and levee, Mississippi River, Chain of

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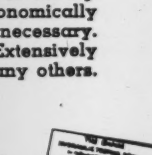

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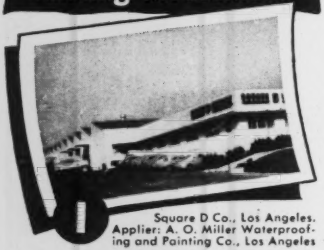

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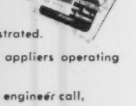

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Rocks Canal, Granite City, Serial No. Eng. 23-065-49-129, from McWilliams Dredging Corp., 860 St. Charles St., New Orleans, La., **$7,369,753.** Est. $6,775,653. CD 4/14—ENR 5/26.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, May 18, repair to East Jetty, Southwest Pass, Mississippi River, Baton Rouge to Gulf of Mexico, Serial No. Eng. 16-064-49-274, from Lester F. Alexander Co., Audubon Bldg., New Orleans, **$500,000.** CD 4/22—ENR 5/12.

●New York—Bureau Contracts & Accounts, Albany, June 1, twin steel guard gates on New York State Barge Canal, Little Falls, Herkimer Co., from S. A. Scullen, Waterford, **$534,500;** twin steel guard gates at New York State Barge Canal, Herkimer, Herkimer Co., from Lane Constr. Corp., 37 Colony St., Meriden, Conn. **$1,040,693.** CD 5/20—ENR 5/26, under N. Y., Little Falls.

●†North Dakota—U. S. Eng., Fort Lincoln, Box 500, Bismarck, May 3, hydraulic turbines for Garrison Dam Proj., near Riverside, Inv. No. 76, from Newport News Shipping & Dry Dock Co., Newport News, Va., **$2,716,250.** CD 4/26—ENR 4/28.

●†Washington—Bureau Reclamation, Dpt. Interior, Coulee Dam, May 26, earthwork, structures, Station 1 plus 28.67 to Station 965 plus 00, Winchester wasteway, Columbia Basin Proj., at West Canal about 8 mi. east of Quincy, exten. in southeasterly direction from that point. Spec. 2648, from J. A. Terteling & Sons, Inc., 4011 Fairview Ave., Boise, Idaho. **$1,088,793.** CD 4/25—ENR 5/19.

CONTRACTS AWARDED

●†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., earthwork, concrete lining, structure, access road, Horsetooth Feeder Canal, Station 67 plus 52.1 to Station 475 plus 61.0 exclusive of Tunnels 2, 3 and 4, about 8 mi. west of Loveland to about 6 mi. southwest of Ft. Collins, Larimer Co., Colorado-Big Thompson Proj., Spec. 2613, to Western Paving & Constr. Co., 5220 Washington St., Denver, **$2,369,655.** Bids 4/19, awarded 5/20. CD 4/21—ENR 4/28, under LB.

†Oregon—Bureau Reclamation, Dpt. Interior, Bend, rehabilitation Ochoco Dam, spillway and outlet works, Crook Co., Spec. 2614, to Dragline Rentals Co., Box 237, Long Beach, Calif., **$573,545.** Bids 5/3, awarded 5/26. CD 5/10—ENR 5/12.

●†Washington—Bureau Reclamation, Dpt. Interior, Coulee Dam, 16.75 miles, extens. of East Low Canal on Columbia Basin Proj., incl. constr. 6.5 mi. Rocky Coulee wasteway and 2 earth-fill dikes, Spec. 2603, to J. A. Terteling & Sons, 4011 Fairview Ave., Boise, Idaho, **$8,029,762.** Bids 4/15, awarded 5/20. CD 4/19—ENR 4/21, under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

June 14

Fla., Miami—TERMINAL ADDN.—Dade Co., terminal addn., at Miami International Airport, Steward & Sikes Sts., 223 S. E. First st., archts. Extended date. CD 5/25.

June 15

†Fla., Jacksonville—PARKING AREA—Com. E. J. Peltier, engr., OCC Administration Bldg. 1, Naval Air Station, approx. 3800 sq. yd. airplane parking area, incl. stabilization of adjacent area. Spec. 2217, from Bureau Yards & Docks Annex, Navy Dpt., Arlington, Va. Plans deposit $10.

†Fla., Jacksonville—AIRPORT FACILITIES—U. S. Eng., Post Office Bldg., Savannah, Ga., constr., rehabilitation of Air National Guard Facilities, Jacksonville Municipal Airport. Serial No. Eng-09-133-49-191. Extended date. CD 4/6—ENR 5/19.

†Pa., Johnsville—STATION—Pub. Wks. Office, Phila., Naval Base, Phila., Naval Air Development Station extens., replacements, Spec. 2222, Approx. $50,000.

June 16

†Fla., Tampa—FAMILY QUARTERS—U. S. Eng. Post Office Bldg., Savannah, Ga., family quarters at MacDill Air Force Base, Serial No. Eng.-09-133-49-188. Extended date. CD 5/11—ENR 5/19.

†Fla., Tampa—OUTSIDE UTILITIES—U. S. Eng., Post Office Bldg., Savannah, Ga., outside utilities for family quarters at MacDill Air Force Base, Serial No. Eng-09-133-49-192.

June 17

†Pa., Phila.—CATAPULT BLDG.—U. S. Navy Dpt., Pub. Wks. Office, Phila. Naval Base, catapult bldg. completion at Mustin Field, Spec. 22106. Approx. $25,000.

June 20

†Fla., Jacksonville—SPRINKLER SYSTEMS—Yards & Docks, Administration Bldg. 1, Naval Air Station, sprinklers in 7 bldgs. and existing sprinkler systems addns., exten., fire mains, and installing auxiliary electrical equip. at Naval Air Station, Spec. 2265(7. Plans deposit $20.

LOW BIDDERS

†Ga., Marietta—RUNWAY EXTENS.—U. S. Eng., Post Office Bldg., Savannah, May 25, exten. runways at Marietta Air Force Base, from E. A. Hudson's Sons, Bolton, **$405,888.** CD 5/19.

Neb., Omaha—AIRPORT IMPRVS.—City, City Hall, 18 and Farnam Sts., May 24, airport imprvs., various constr. other than bldgs. from Peter Kiewit Sons Co., Omaha National Bank, **$916,545.** CD 5/12—ENR 5/19.

●†Va., Langley Field—RESEARCH HANGAR—Civil Aeronautics Admin., Langley Field, May 25, flight research hangar and laboratory, West Area, Spec. L 1447 from Wise Contg. Co., 8 and Grace Sts., Richmond, **$2,959,513.** CD 5/19.

PUBLIC BUILDINGS

BIDS ASKED

June 13

Conn., Wilton—Bd. Educ., Town Hall, Junior High School. Plans deposit $35. O'Connor & Killian, 101 Park Ave., New York, Zone 17, N. Y., archts. CD 9/8/48—ENR 9/30/48.

June 14

N. Y., Valley Stream—Bd. Educ., Union Free School Dist. 30, Valley Stream school, Shore Ave. $325,000. Plans deposit $25. Frederick P. Wiedersum, 240 Rockaway Ave., archt. CD 6/9/47—ENR 7/24/47.

†Pa., Phila.—U. S. Navy Dpt., Pub. Wks., Office, Phila. Naval Base, aeronautical materials laboratory bldg., and fire protection sys. Approx. $15,000.

†Wis., Alma—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., garage type utility bldg., Lock and Dam 4 on left bank of the river, at Alma, approx. 27 mi. upstream from Winona, Minn. CD 5/17—ENR 5/19.

†Wis., Genoa—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., garage type utility bldg., Lock and Dam 8, on left bank of river, approx. 18½ mi. downstream from La Crosse. CD 5/17—ENR 5/19.

†Wis., LaCrosse—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., garage type utility bldg., Lock and Dam 7, on right bank of the river about 5 mi. upstream from here. CD 5/17—ENR 5/19.

†Wis., Lynxville—U. S. Eng. 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., garage type utility bldg., Lock and Dam 9, on left bank of the river, approx. 13 mi. upstream from Prairie du Chien. CD 5/17—ENR 5/19.

Wis., Nekoosa—Bd. Educ., Nekoosa, 1 story, 60x350 ft. school, 20x100 ft. wing, steel, brick, block construction, concrete fdn. Plans deposit $10. Donn Hougen, Wisconsin Rapids, archt. CD 11/3—ENR 11/11, under LB.

†Wis., Trempealeau—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul 1, Minn., garage type utility bldg on left bank of river, approx. 11½ mi. downstream from Winona. CD 5/17—ENR 5/19.

June 15

La., Bogalusa—Div. Admin., 201 Capitol Annex, Baton Rouge, 2 story, brick, concrete, steel Washington St. Tammany Charity Hospital. $500,000. Extended date. Plans deposit $50. Smith & Padgett, 512 Ouachita National Bank Bldg., Monroe, archts. CD 3/23—ENR 3/31.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, New York Zone 7, street and yard imprvs. for Glenwood Houses Proj. No. NYD-12 in area bounded by Farragut Rd., E. 56 St., Ave. H, Glenwood Rd. and Ralph Ave. Plans deposit $25.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 7, street and yard imprvs. for Nostrand Houses Proj. NYD-11, in area bounded by Avenue X, Bragg St., Avenue V and Batchelder St. Plans deposit $25.

●N. Y., Homer—Bd. Educ., Homer Central School Dist., Homer, high school, $1,218,500; grade school addns., alterations, $539,000. Wallace P. Beardsley, Seward Block, Auburn, archt.

June 17

Ind., Noblesville—Bd. Comrs., Hamilton, Co., Court House, 3 story, brick, rein.-con., steel county memorial hospital, $600,000. Walter Scholer & Assoc., 1314 State St., Lafayette, archts. CD 2/13/47—ENR 3/16/47.

●†N. M., Los Alamos—U. S. Atomic Energy Comn., Los Alamos, 1 story, part basmnt., rein.-con. CMR-10 bldg., Inv. No. 291-49-150. Approx. $1,000,000. Plans deposit $50.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, New York, Zone 7, top soil and planting for Glenwood Houses, Proj. No. NYC-12 in area bounded by Farragut Rd., E. 56 St., Avenue H, Glenwood Rd. and Ralph Ave. Plans deposit $25.

June 20

●†N. M., Los Alamos—U. S. Atomic Energy Comn., Los Alamos, 5 frame apartments, concrete fdn., $950,000; 2 frame apartments, concrete fdn., $740,000; 9 frame apartments, concrete fdns., $750,000, incl. outside utilities, grading and paving for each, Serial No. 291-49-155. Plans deposit $50 each.

June 22

●Ind., North Madison—State, P. Wks. & Supply Div., Dir. Mybeck, 404 State House, Indianapolis, 2 story, brick, rein.-con., steel personnel bldg. addn. to hospital. $1,000,000. McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, archts. CD 2/27/46—ENR 3/18/46.

●Mass., Cambridge—City of Cambridge Housing Auth., 1416 Massachusetts Ave., 109 unit 3 story, brick veterans housing Proj. 200-2, Rindge Ave., Clifton St. $1,320,000. Plans deposit $50. Edward T. P. Graham, 171 Newbury

St., Boston, archt. Gilbert Small & Co., Inc., 10 State St., Boston, structural engr. CD 9/21—ENR 10/14.

June 28

●**N. Y., Rome**—Bd. Educ., N. George St., Junior High and Elementary School, $3,000,000. Plans deposit $100. Extended date. Starrett & Van Vleck and Reginald Marsh, 101 Park Ave., New York, Zone 17, archts. CD 5/19—ENR 5/26.

June 29

●**Va., Hampton**—School Bd. Elizabeth City Co., 2 and 3 story, brick George Wythe Junior High School. Approx. $1,000,000. Plans deposit $40. Williams, Coile & Blanchard, 403 Nelson Bldg., Newport News, archts.

Bids Asked

Que., Lachine—A. St. Denis, secy. c/o Lachine School Comrs., 110 Fifth Ave., 4 story, 62x130 ft. concrete brick boys and girls school, Notre Dame St. W. between 33 and 34 Sts. Approx. $500,000. P. Lemieux, 760 Victoria Su., Montreal, archt. CD 2/4—ENR 2/17.

LOW BIDDERS

●†**Calif., Point Loma (Sta. San Diego)**—U. S. Navy, 1220 Pacific Hy., San Diego, May 24, laboratory and supply bldg., Spec. 22011, from Trepte Constr. Co., 2001 Ketner Blvd., San Diego, **$1,065,000.** Bids 5/24. CD 5/5—ENR 5/12.

Ga., Thomaston—Upson Co., Thomaston, May 26, hospital, from S. J. Curry & Co., Albany, **$860,770.** CD 4/25—ENR 4/28.

Mass., Westboro—Commonwealth of Massachusetts, Dpt. Mental Health, 100 Nashua St., Boston, May 20, power plant, State Hospital, P. M 36 Contr. 1, from Poley-Abrams Corp., 2 Elm Pl., Brookline, **$632,000,** Alternate 1 **$599,000,** Alternate 2 **$565,500.** CD 5/3—ENR 5/5.

Tex., Dallas — Dallas Co., Al Templeton, judge, Court house, rejected bids May 12, masonry, juvenile headquarters bldg., L. B. **$683,-600.** CD 5/1—ENR 5/26, under LB.

●†**Wis., Madison** — U. S. Eng., Clock Tower Bldg., Rock Island, Ill., May 26, general contract Veterans Admin. Hospital, Serial No. Eng-11-117-49-21, for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash., 25, D. C., from Gust K. Newberg, 9 S. Clinton St., Chicago, Ill., **$7,111,000;** elevators, from The Westinghouse Electric Corp., 150 Pacific St., Jersey City, N. J., **$284,663.** CD 5/9—ENR 5/19.

●**Wis., Milwaukee**—Housing Auth. of City of Milwaukee, 844 N. Market St., Zone 2, rejected bids May 18, general contract 392 units of Veterans Permanent Housing Proj. II, L.B. **$2,-779,300.** Will re-advertise. CD 5/24—ENR 5/26, under LB.

CONTRACTS AWARDED

Calif., Long Beach—City School Dist., 715 S. Locust Ave., 1 story, rein.-con. Jordon High School gymnasium, shower and locker bldgs., swimming pool, to Stanton-Reed Co., 816 W. 5 St., Los Angeles, **$579,347.** Bids 5/19, awarded 5/23. CD 5/26—ENR 6/2, under LB.

●**Calif., Mendocino**—State Div. Architecture, P. Wks. Bldg., Sacramento, 3 ward bldgs., combination kitchen, commissary and bakery with combined floor area of 150,000 sq. ft., to Moore & Roberts, 693 Mission St., San Francisco, **$1,-594,777.** Bids 3/29. CD 4/5—ENR 4/7, under LB.

Calif., San Francisco—State Div. Architecture, P. Wks. Bldg., Sacramento, general contract 1 story, bsmnt., rein.-con. power house shops and physical education facilities bldg. (gymnasium and swimming pool) 75,000 sq. ft. floor area, San Francisco State College Campus, to Empire Constr. Co., 344 Harriet St., San Francisco, **$742,000.** Bids 5/17. CD 5/25—ENR 6/2, under LB.

Calif., Tracy—Tracy Union High School Dist., Tracy, rein.-con., steel Tracy Union High School bldgs., incl. classroom, homemaking, locker and shower, gymnasium and corridors, to M. A. Lilley, 1 Grand View St., San Francisco, **$524,-000.** Bids 5/24, awarded 5/24. CD 5/10—ENR 5/12.

●**Calif., Tulare**—Tulare Local Hospital Dist., Box 656, 2 story, bsmnt., rein.-con. 73 bed hospital and rein.-con. laundry bldg., to Trewhitt-Shields & Fisher, 926 Parallel St., Fresno, **$1,-078,000.** Bids 5/4. CD 5/11—ENR 5/19, under LB.

Idaho, Moscow—University of Idaho, Moscow, general contract agriculture science bldg., to W. G. Clark Co., 408 Aurora Ave., Seattle, Wash., **$519,960.** Bids 5/24. CD 5/31.

●**Md., Baltimore**—Mayor & City Council, City Hall, 2 story School 239, Benjamin Franklin School, addns., alterations, to Philip Vizzini, 504 Stamford Rd., **$1,088,000.** Bids 5/4, awarded 5/11. CD 5/10—ENR 5/12, under LB.

Mass., Athol — Athol Memorial Hospital, hospital, 435 Main St., to William Belbin, 1333 Main St., **$623,630.** Bids 5/17, awarded 5/25. CD 5/24—ENR 6/2, under LB.

Miss., Sanatorium—State Building Comn., Jackson, tuberculosis infirmary for negroes, to Flint Bros. Constr. Co., Deposit Guaranty Bldg., Jackson, **$846,320.** Bids 5/24. CD 5/3—ENR 5/5.

†**N. M., Los Alamos**—U. S. Atomic Energy Comn., Los Alamos, 18 rein.-con. bldgs., appurtenances, to R. E. McKee, P. O. Drawer, 562, El Paso, Tex., **$617,000.** Bids 5/12. CD 5/25—ENR 6/2.

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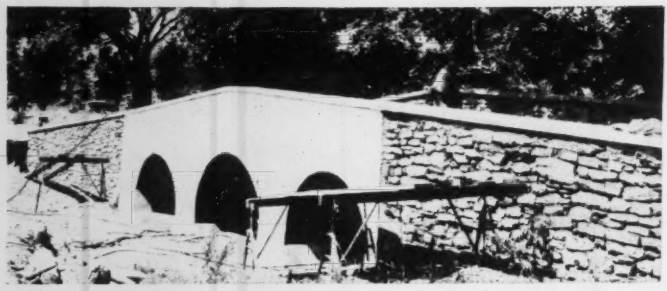

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●**N. M., Las Cruces**—U. S. Eng., P. O. Box 1538, Albuquerque, family quarters, White Sands Proving Grounds area. Serial No. Eng-29-005-4975, to Texas Housing Co., 3003 Denton Dr., Dallas, Tex. and New Mexico Housing Co., Box 1197, Santa Fe, **$1,083,215.** Bids 5/11. CD 5/18—ENR 5/26, under LB.

N. Y., Flushing—Bd. Transportation, 250 Hudson St., New York. Zone 13, May 20, general contract, Flushing Bus Garage, near Roosevelt Ave. between 123 and 126 Sts., to Henry M. Weitzner, Inc., 205 W. 34 St., New York, Zone 1. **$807,493.** Bids 5/20. CD 5/2—ENR 5/12.

●**Pa., Woodville**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general contract cafeterias bldg. at Woodville State Hospital, to Henry Busse, 112 Wabash St., Pittsburgh, **$1,128,128.** Bids 5/4, awarded 5/26. CD 5/9—ENR 5/12, under LB.

●**Alta., Calgary**—Calgary Exhibition & Stampede Ltd., Calgary, coliseum, to Bird Constr. Ltd., Seventh St., Regina, Sask., **$1,100,000.**

Ont., London—Dpt. P. Wks., Hunter Bldg., Ottawa, research laboratories and offices, University of Western Ontario, campus, to Dinsmore-McIntire, Ltd., 1204 Canada Bldg., Windsor, **$911,869.** Bids 4/13. CD 4/27—ENR 5/5, under LB.

●**Ont., Windsor**—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 500 housing units, Windsor Proj. 13-49, to Sterling Constr. Co., Ltd., 2494 Sandwich St. E., Approx. **$3,500,000.** Bids 5/20 CD 5/6—ENR 5/12.

Que., Val d'Or—Central Mortgage & Housing Corp., 70 Lyon St., Ottawa, Ont., 88 houses, to Paquin Constr. Co. Ltd., 7 Fourteenth St., **$550,000.** CD 1/26—ENR 2/17.

COMMERCIAL BUILDINGS

BIDS ASKED

June 14

O., Lorain—St. Josephs Hospital, c/o Carl Robinson, Broadway and 21 St., 3 story, bsmnt., hospital alterations, addn., Broadway between 20 and 21 Sts., $725,000. G. S. Ridder Co., 3800 Terminal Tower Bldg., Cleveland, archt. Hospital Consultants, N. Michigan Ave., Chicago, Ill., engr. CD 5/13—ENR 6/2.

June 15

Conn., Putnam—Bd. Trustees, Day-Kimball Hospital, 175 Pomfret St., brick, steel, concrete hospital addn., Pomfret St. $2,500,000. Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, archts. CD 3/24/48—ENR 4/8/48.

Ia., Waterloo — Scholtz Memorial Hospital, Waterloo, hospital. $275,000. Extended date. Skidmore, Owinngs & Merrill, 160 W. Monroe St., Chicago, Ill., archts. CD 4/20—ENR 4/28.

N. Y., Corning—Corning Hospital, 163 First St., hospital addns., alterations, $470,000. Plans deposit $25. Haskell, Considine & Haskell, Hulett Bldg., Elmira, archts.

N. Y., Lake Placid—Lake Placid Memorial Hospital, Lake Placid, hospital, $600,000. Weil Alban Cannon & Assocs, 2637 Main St., Niagara Falls, archts.

S. D., Watertown—Midland National Life Insurance Co., Watertown, 3 story office, $275,000. K. M. Fullerton, Anchor Bldg., St. Paul, Minn., archt.

June 21

●**Wash., Pasco**—Sisters of St. Joseph of Carondelet, Pasco, 2 story, 47x228 ft., rein.-con. Our Lady of Lourdes Hospital addn., $1,000,000. Plans deposit $50. J. W. Maloney, Central Bldg., Seattle, Zone 4, archt. CD 2/25—ENR 3/10.

June 22

N. Y., Massena—Massena Memorial Hospital, Town Hall, hospital addn. $750,000. Smith & Stickney, 154 East Ave., Rochester, archts.

June 23

●**Del., Wilmington**—John Wanamaker, City Hall Square, Phila., Pa., department store, shopping center, and parking area. $2,000,000. Massena & duPont, 704 Delaware Ave., Wilmington, archts. Louis A. Deane, Penna. R.R. Bldg., Wilmington, engr. CD 12/30/47—ENR 1/1/48.

Bids Asked

Ill., Chicago—Peter G. Maniates, 11 S. LaSalle St., 125x263 ft., steel, brick store and office, W. 95 St. from Oakley to Claremont Sts. $450,000. Irving M. Karlin, 1314 S. Wabash St., archt.

●**Tex., El Paso**—El Paso Natural Gas Co., Hasbett Tower, 9 to 14 story office, $2,250,000. CD 5-25

SOON LETS CONTRACT

Calif., Huntington Park—J. C. Penney Co., c/o Harold S. Johnson, archt., 606 S. Hill St., soon lets contract 3 story, 100x150 ft. masonry store, $475,000. CD 4/27—ENR 5/19.

Conn., New Milford—New Milford Hospital, Inc., 21 Elm St., soon lets contract brick, steel hospital addn. $570,000. Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, archts. CD 3/4—ENR 3/27/48.

N. Y., Bayshore—South Side Hospital, Montauk Hy., soon lets contract hospital, $654,500. Eggers & Higgins, 542 Fifth Ave., New York, Zone 19, archts.

●**N. Y., Brooklyn**—Wyckoff Heights Hospital, St. Nicholas Ave. and Stanhope St., soon lets contract hospital addn., 374 Stockholm St. Crow, Lewis & Wick, 200 Fifth Ave., New York, archts. CD 5/6—ENR 5/26.

Tex., Dallas—Great American Reserve Life Insurance Co., 715 N. St. Paul St., soon lets contract 4 story, bsmnt., brick, steel office, $600,000, George L. Dahl, 2101 N. St. Paul St., archt. CD 1/21—ENR 2/17.

LOW BIDDERS

●**La., New Orleans**—De Paul Sanitarium, Sister Ann, administrator, 1038 Henry Clay Ave., May 24, 5 story, 58x235 ft., concrete, brick, limestone bldg. addn., from R. P. Farnsworth & Co., Inc., 1515 S. Salcedo St., **$1,047,000.** CD 5/24—ENR 6/2.

CONTRACTS AWARDED

●**Calif., Los Angeles**—Chase Development Co., Fulton and Riverside Dr., 240 housing units in 19 bldgs., Fulton and Riverside Dr., to Republic Constr. Co., 1618 N. Las Palmos Ave. Approx. **$2,000,000.** Heath Wharton, 672 S. La Fayette Park Pl., archt. CD 7/16/47—ENR 6/31/47.

●**Calif., Monterey Park**—Grandview Constr. Co., 470 S. Beverly Dr., Beverly Hills, 223 frame, stucco dwellings near 3 St. and Garfield Ave. Owner builds. Approx. **$1,000,000.**

Calif., San Bernardino and Gardena—Sponsler & Sons, 1226 W. 5th St., Los Angeles, 100 frame, stucco dwellings 2 mi. from San Bernardino Air Base, **$450,000;** 100 frame, stucco dwellings, 168 St. and Vermont Ave. **$450,000.** Owner builds.

Calif., Stockton—Woodbridge Realty Co., 2310 N. ElDorado St., 105 stucco, rustic residences in Wilshire Tract, to Coast-Wide Investment Corp., Wilkinson & Purinton & Howard H. Mead 815 Longview Ave. Approx. **$800,000.**

●**Fla., Miami**—Emelen Apartments, Inc., 407 Biscayne Blvd., 14 apartments. Owner builds. Approx. **$1,000,000.** M. M. Ungaro, Olympia Bldg., archt.

●**Fla., Tampa**—Helmar Gardens, Inc., c/o A. J. Simms, pres., 501½ Franklin St., 250 homes. Owner builds. Approx. **$1,000,000.**

●**Ill., Chicago** — Augustana Hospital, 401 W. Dickens Ave., general contract 8 story, brick, steel, concrete hospital addn., 1 story cloister and chapel, to Carl E. Erickson Co., 4657 N. Ravenswood St., Approx. **$1,000,000.** CD 1/28—ENR 2/3.

●**Minn., Hopkins**—A. Ginkel, Hopkins, 145 units, 2 story, bsmnt. housing. Owner builds. **$1,381,860.** G. W. Shiffler, Backstrom & Assoc., 17 W. Franklin Ave., Minneapolis, archts.

Mont., Butte—Butte Conference of Catholic Clergy, Butte, girls central high school, to Cahill-Mooney Constr. Co., 220 E. Front St. **$800,000.** J. G. Link & Co., 217 Electric Bldg., archts. CD 11/4—ENR 11/18.

N. J., Riverton—Cedar Lane Manor Apartments, inc., c/o contractor, apartment development Cedar St., to McVaugh Constr. Co., 9 Woodside Lane. Approx. **$2,500,000.** Dante D'Ambastasto, 1815 Federal St., Phila., Pa., archt. (**Correction**—contractor). CD 5/27—ENR 6/2, under CA.

●**O., Parma**—Parkside Gardens, Inc., c/o Gaudreau Bldg. Corp., 308 Marshall Bldg., Cleveland, twenty-five 335 suite, 33x68 ft., 33x76 ft. and 33x102 ft. brick, concrete block garden type apartments, Brookpark Rd and Metropolitan Parkway, separate contracts. Approx. **$2,500,000** Wm. Harris, 417 N. Washington Ave., Alexandria, W. Va., archt.

●**O., Parma**—Parkway Gardens, Inc., c/o Dwyer Constr. Co., 305 Marshall Bldg., Cleveland, 33 garden -type apartments, incl. 44 suites, 3 story, bsmnt., 33x68 ft., 33x76 ft. and 33x102 ft. brick, concrete block garden type apartments Brookpark Rd. and Metropolitan Parkway, separate contracts. **$3,500,000.**

Okla., Tulsa—Bryce, Hanson & Harrison, Marshall Bldg., 8 story, bsmnt. apartment hotel, 18 and Boulder Sts., to Waller-Wells Constr. Co., 2504 E. 14 St., **$980,000.** Awarded 5/16. John Cushing, Marshall Bldg., archt.

●**Pa., Philia.**—John M. Zerby, 8533 Forrest Ave., Elkins Park, residential development, Cottman St. and Bustleton Ave., separate contracts, **$3,500,000.**

Pa., Pittsburgh—Carnegie Institute of Technology, Schenley Park, 3, 4 and 5 story, 54x90 ft. and 40x57 ft., irregular shape, brick, steel engineering hall addn., alterations, to Crump, Inc., 4031 Hazelow Blvd. **$912,000.** Bids 3/7. CD 2/23—ENR 2/31, under LB.

●**Tex., Houston**—F. A. Hunter Lumber & Building Co., 5007 Telephone Rd., 244 unit apartment, Evergreen, Woodridge, Kellard and Coral Sts., Pecan Park, Owner builds. Approx. **$1,800,000.** CD 5/26

●**Tex., Houston**—Southcrest, Inc., Union National Bank Bldg., 340 houses, Griggs and Mykawa Rds., to L. Vernon Miller, 2015 McClendon St., Approx. **$2,600,000.** CD 5/13—ENR 6/2.

●**Wash., Tacoma**—M & M Third Addn., c/o J. H. March, 3002 S. Steele St., 230 house development, Lake D st., own forces. **$1,380,000.** Worthen & Wing, Clover Park Bldg., 11120 Gravelly Lake Dr., Zone 9, engrs.

●**Ont., Hamilton**—Don Grant, E. 22 St., 200 unit housing, Fernell and Sherman Aves. Owner builds. Approx. **$1,000,000.** A. J. E. Smith, c/o owner, engr.

●**Ont., London**—Sisters of St. Joseph, Sacred Heart Convent, London, 6 story, steel, reinf.-con., brick, stone hospital, Richmond and Grosvenor Sts., to Hyatt Bros., Ltd., 29 Egerton St., Approx. **$1,200,000.** Bids 5/26. CD 5/10—ENR 5/12.

Que., Sillery (Postal Dist., Quebec City)—Industrial Life Insurance Co., 319 Blvd. Charest, 2 story, bsmnt., 138x295 ft. office, St. Louis Rd., Sillery, to Albert Bedard, 132 St. Partick St. Approx. **$600,000.** M. Bouchard & P. Rinfret, 400 Blvd. Charest, archts. CD 5/3—ENR 5/12.

INDUSTRIAL BUILDINGS

BIDS ASKED

June 15

La., New Roads — WAREHOUSE, etc. — Point Coupee Membership Corp., New Roads, 1 story, brick, tile, concrete warehouse and office. Plans deposit $10. J. Roy Haase 655 Laurel St., Baton Rouge, archt.

Bids Asked

Conn., Glastonbury—WAREHOUSE—Consolidated Tobacco Co., 651 Windsor St., Hartford, (selected list Electric Membership Corp., New Roads, 1 story, brick, tile, concrete warehouse and office. Plans deposit $10. J. Roy Haase 655 Laurel St., Baton Rouge, archt. 1 story, $7,000 sq. ft. brick, cinder block warehouse, Oak St. $420,000. Mylchrest & Reynolds, 238 Palm St., Hartford, archts. CD 5/13—ENR 6/2.

Ill., Chicago—WAREHOUSE, etc.—Central Solvents & Chemicals Co., 2545 W. Congress St., 1 story, steel, masonry warehouse and process bldg. $75,000. Plans deposit $10. Vern E. Alden Co., 120 S. LaSalle St., engr.

●**Pa., Phila.**—RESEARCH LABORATORY—E. I. duPont de Nemours & Co., Inc., Nemours Bldg., Wilmington, Del., research laboratory. $2,000,000. H. M. Gordon, c/o owners, Constr. Div. engr. CD 5/9—ENR 5/26.

●**Tex., Houston** — WAREHOUSE — The Finger Interests, c/o Hiram and Aaron Finger, 3131 Calhoun Rd., five 1 story 65,000 sq. ft. structural steel frame warehouses, concrete slab fdns. **$1,500,000.** J. B. Dannenbaum, 2940 Main St., engr. CD 8/21/47—ENR 9/11/47.

W. Va., Rowlesburg — DIESEL — Baltimore & Ohio Railroad Sys., A. C. Clarke, ch. engr., Baltimore and Charles Sts., Baltimore, Md., diesel facilities bldg. Over **$68,000.**

SOON LETS CONTRACT

Tex., Houston — WAREHOUSE — Moncrief-Lenoir Mfg. Co., 2103 Lyons St., soon lets contract 2 story, 166x132 ft. rein.-con. steel warehouse, two 97x132 ft. steel, iron cran-way bldgs. $350,000. W. E. Simpson Co., Milam Bldg., San Antonio, engr.

LOW BIDDERS

●**Tex., Dallas** — PLANT — Eastman Kodak Co., 343 State St., Rochester, N. Y., May 17, 3 story, 60,000 sq. ft. plant, air-conditioning, from Henry C. Beck, 1205 Irwin-Keasler Bldg., **$1,259,382.** CD 5/3—ENR 5/12.

CONTRACTS AWARDED

●**N. Y., Long Island City**—WAREHOUSE, etc. —General Electric Appliance Co., 205 E. 42 St., New York, Zone 17, warehouse and office, Northern Blvd. near 48 St., to Thompson-Starrett Co., 444 Madison Ave., New York, Zone 22. Approx. **$1,000,000.** CD 4/28—ENR 5/19.

●**Tex., Longview**—POWER PLANT—Southwestern Gas & Electric Co., 428 Travis St., Shreveport, La., power plant, to Austin Bldg. Co., Longview, **$4,750,000.** A. B. McIver, c/o owner, engr. CD 1/28—ENR 2/3.

●**Wis., Granville (P. O. Milwaukee)**—PLANT—American Can Co., 230 Park Ave., New York, N. Y., 6 bldgs., 1 story, can mfg. plant, to Turner Constr. Co., 105 W. Adams St., Chicago, Ill. Approx. **$2,000,000.**

●**Wis., LaCrosse** — STORAGE CELLARS — G. Heileman Brewing Co., 1027 S. 3 St., 5 story, 80x100 ft., concrete, steel, brick, storage cellars, to L. G. Arnold, Inc., 201 N. Dewey St., Eau Claire. Approx. **$1,400,000.** Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., engr. and archt.

UNCLASSIFIED

BIDS ASKED

June 13

Conn., Madison — BOARDWALK — State, Raymond S. Thatcher, comptroller, State Capitol, Hartford, reconstr. 3,000 ft. boardwalk, Hammonassett Beach, Proj. B/A-T-14, $55,800.

N. Y., New York—PIER—Comr. Marine & Aviation, Pier A, North River, foot of Battery Pl., Zone 4, rehabilitation Pier 39, foot of W. Houston St., North River, Manhattan Boro. Plans deposit $3. CD 1/14/48.

June 15

Nebraska—RURAL DISTRIBUTION LINES —Loup Valley Rural Electric Membership Assn., Ord, 327.7 mi. distr. lines, Greeley, Garfield, Sherman, Valley and Wheeler Counties. $325,000. Raymond H. Reed & Co., Columbus, engrs. CD 3/29—ENR 4/7.

Ont., Port Stanley—PIER—J. M. Somerville, secy. Dpt. P. Wks., Hunter Bldg., Ottawa, pier reconstruction, Approx. $100,000. Plans deposit $25. R. Blais, c/o owner, engr.

Que., Matane—WHARF—Dpt. P. Wks., J. M. Somerville, secy., Hunter Bldg., Ottawa, Ont., wharf reconstruction. Approx. $350,000. R. Blais, c/o owner, engr. CD 3/17/48—ENR 4/15/48.

About June 16

†Miss., Corinth — CEMETERY IMPRVS. — U. S. Eng., 2301 Grant St., Mobile, Ala., Imprvs. at Corinth National Cemetery, Serial No. Eng. 01-076-49-54.

†Tenn., Memphis—CEMETERY IMPRVS.—U. S. Eng., 2301 Grant St., Mobile, Ala., entrance and landscaping, Memphis National Cemetery, Serial No. Eng-01-076-49-174. CD 8/13—ENR 8/19, under LB.

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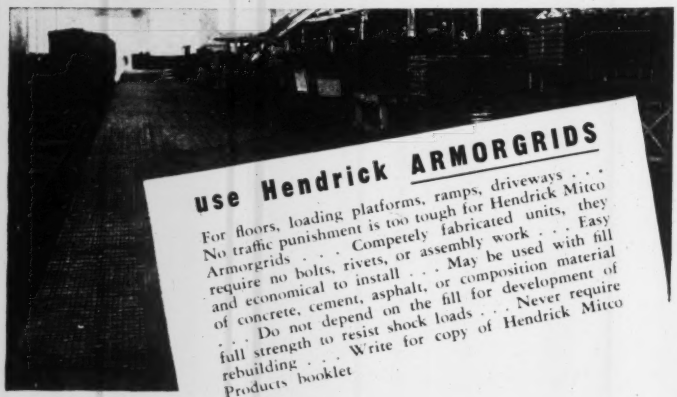

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MOTT CORE DRILLING CO.
HUNTINGTON, W. VA.

June 17

†Connecticut — RADAR TOWERS — U. S. Eng., State Armory, Hartford, radar towers alterations, addns., 7½x7½xX½ ft. on top of 32 ft. tower, Milford; 40 ft. tower, Madison; 50 ft. tower, Groton; all wood and cement asbestos. Plans deposit $10.

Kansas—RURAL DISTRIBUTION LINES—Norton-Decatur Co-operative, Norton, labor only, 413.17 mi. rural distr. lines, Decatur, Sheridan, Norton, Graham, Phillips and Rooks Counties, $140,000. Raymond H. Reed & Co., Columbus, Neb., engr. CD 12/31—ENR 1/20.

†La., Baton Rouge—CEMETERY FACILITIES—U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex., addnl. facilities, Baton Rouge National Cemetery, Serial No. Eng. 41-243-49-313.

●Wash., Seattle—UTILITY TUNNEL—University of Washington, Education Hall, 3200 ft. utility tunnel, 6 ft. wide, and 8½ ft. high, $1,000,000. Plans deposit $20. Lincoln Bouillon & Assoc., 1411 4 Ave. Bldg., archts. CD 1/6/48—ENR 1/8/46.

About June 20

†N. M., Albuquerque—ELECTRICAL DISTRIBUTION—U. S. Eng., P. O. Box 1538, reconstructing electrical distr. sys., (EOP-921-ROP-924), Sandia Base, Serial No. Eng-29-005-49-108.

June 20

N. S., Halifax—PIER—C. P. Buckley, secy. National Harbours Bd., West Block, Ottawa, Ont., reconditioning concrete piles, Pier 2, D. W. T. Halifax Harbour, Approx. $100,000. Plans deposit $25.

June 21

Calif., Los Angeles—PARK BLDG., etc.—Bd. Supervs. Los Angeles Co., 501 Hall of Records, community bldg. at East Montebello Park, Montebello, $62,207. J. H. McDonald, 1013 E. 8 St., archt.; Belvedere Park Bath House, East Los Angeles, Prop. A, $31,000, Prop. B $27,387. J. Earl Trudeau, 40 W. Bay St., Alhambra, archt.; 50x106 ft. bathhouse and swimming pool, Palmdale $102,400. W. H. Taylor, archt. and N. D. Whitman, engr., both 109 S. Los Robles St., Pasadena.

June 22

†Oregon—TRANSMISSION LINES—Bonneville Power Admin., 729 N. E. Oregon St., Portland, Zone 8, 22.6 mi. 115 KV transmission line, Forest Grove-McMinnville, Inv. 4668. Plans deposit $5. L. C. Stewart, 729 N. E. Oregon St., Portland, Zone 8, engr.

†Tenn., Oak Ridge—GAS DISTRIBUTION SYSTEM—United States Atomic Energy Comm., P. O. Box 365, gas distr. sys., existing permanent area, Inv. No. 401-49-13 A. Plans deposit $75.

June 23

California—TRAFFIC SIGNAL SYSTEMS, etc.—State Div. Hys., Sacramento, furnishing, installing full traffic actuated signal systems and intersection lighting at intersection of State Hy. with 5 and Grand Aves., Escondido, San Diego Co. G. T. McCoy, state hy. engr.

LOW BIDDERS

●Minnesota—RURAL DISTRIBUTION LINES—Rural Co-operative Power Assn., Maple Lake, rejected bids Apr. 13, rural distr. lines, Pine, Chisago, Isanti, Sherburne, Mille Lacs, Meeker, Kandiyohi, Benton and Wright Counties, LB, **$1,051,621.** CD 5/3—ENR 5/12, under LB.

●Tennessee — PIPELINE — East Tennessee Natural Gas Co., Wade Thompson, pres., Third Natl. Bank Bldg., Nashville, 17.2 mi. 22 in. pipeline from Greenbrier to Oak Ridge, from Oman Constr. Co., Acklen Park, Nashville, Approx. **$10,000,000.** CD 2/6/48—ENR 2/19/48.

CONTRACTS AWARDED

●Arizona—GAS LINE—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex., 102 mi. 26 in. crossover gas line to Topock near Gila. Owner builds. Approx. **$5,500,000.** CD 3/18.

●Colo., Littleton—GRANDSTAND, etc.—Centennial Turf Club, Willard F. Tunney, genl. mgr., Shirley-Savoy Hotel, Denver, 7,500 seat concrete, steel grandstand and turf club and club house and stables for 150 horses, near here, to Colorado Constructors, Inc., 725 W. 39 Ave., Denver, Approx. **$1,750,000.** CD 3/30—ENR 4/28.

●New Mexico Arizona and California—LOOP LINES—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex., 450 mi. 30 in. loop lines, force account. Approx. **$24,500,000.** CD 3/18, under Arizona.

N. Y., New York—POWER EQUIPMENT—Bd. Transportation, 250 Hudson St., Zone 13, installing power equip. for Dyre Avenue Line IRT Div., Bronx Boro, Contr. P-61, to Westinghouse Electric Co., 40 Wall St., New York, Zone 5, **$194,711.** Bids 5/20. CD 5/16.

N. C., Elizabeth City—RACING TRACK, etc.—Virginia-Carolina Racing Assn., c/o contractor, Greyhound Racing Track and grandstands, to Virginia Eng. Co., Newport News, Va., Approx. **$250,000.**

●†Alaska, Anchorage — RAILROAD — The Alaska Railroad, Dpt. Interior, Anchorage, 12.3 mi. Sect. 3, Turnagain Arm railroad-highway reconstruction, to Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co., and S. Birch & Sons Constr. Co., Hoge Bldg., Seattle 4, Wash. **$5,436,036.** Bids 5/11. CD 5/18—ENR 5/26, under LB.

CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

June 23

Tex., Houston—City, M. H. Westerman, secy., City Hall, 900 Brazos St., water pumpstation and related construction for The Heights. $50,000. CD 6/30/44—ENR 7/13/44.

June 24

O., Marietta—Lowell Russell, service Dir., Marietta, WW impry. plant enlargement and rehabilitation, flash mix flocculation equip. and sedimentation equip., concrete structures. $170,000. Plans deposit $10. Alden E. Stilson & Assoc., 209 S. High St., Columbus, cngrs. CD 12/1/47—ENR 12/11/47.

Bids Asked

Tex., Dallas—W. H. Cothrum & Co., 2116 N. Field St., c.i. waterlines, facilities for low cost rental negro housing. $35,000.

LOW BIDDERS

Calif., Los Angeles—Metropolitan Water Dist., 306 W. 3 St., June 1, 2.8 mi. 54 in. pipe Victoria St. Lateral, Torrance, from United Concrete Pipe Corp., Box 425, Baldwin Park, **$555,302.** CD 5/16—ENR 4/19.

N. J., Margate—City, June 2, reservoir, from Standard Eng. & Constr. Co., 1 N. Osborn Ave., **$187,695.** J. J. Somers, Guarantee Trust Bldg., Atlantic City, engr. CD 5/18—ENR 5/26.

Tex., Menard — City, water filtration plant from Clay P. Carey, Box 832, Brownwood, **$51,450.** Est. $60,000. CD 5/11.

CONTRACTS AWARDED

Ill., Carthage—City, City Hall, water and sewerage sys. extens., Reeg Constr. Co., Quincy, **$100,000.** Awarded 6/2. CD 2/11—ENR 3/3.

SEWERS, WASTE DISPOSAL

BIDS ASKED

June 20

Okla., Stillwater — City, sewage disposal plant exten. $75,000. C. H. Guernsey & Co., 1414 N. Robinson St., engrs. CD 1/4—ENR 1/20.

June 21

Calif., Oakland—City, City Hall, sanitary sewers in Gouldin Rd., Alhambra Ave., Aspinwall Rd., Westwood Way and Westerwood Center. Approx. $50,000. Plans deposit $7. Walter Frickstad, City Hall, city engr. CD 5/16/45—ENR 5/31/45.

June 23

Calif., Walnut Creek—Central Contr. Costa Sanitary Dist., 1822 Mt. Diablo Blvd., sanitary sewers in Loaf Imprvt. Dist. 8. Approx. $50,000. Plans deposit $20. Clyde C. Kennedy, 604 Mission St., San Francisco, engr.

Tex., San Antonio—City, Jack White, mayor, City Hall, Salado Creek Sewer Main, Sect. 2, 13,360 lin. ft. 54 and 60 in. gravity sewer pipe, manholes, earthfill, culverts, $239,000; Salado Creek Sewer Main, Sect. 3, 19,450 lin. ft. 48 and 54 in. gravity sewer pipe, manholes, earthfill, culverts, $275,500. Plans deposit $25 each. Beavers & Lodal, c/o D. F. Woffing, 1422 Transit Tower, engrs. CD 4/13—ENR 4/21, under LB.

July 6

O., Warren—City, storm sewers. $250,000. CD 3/16/44—ENR 4/6/44.

July 7

Tex., LaMarque—Galveston Co. Water Control & Imprvt. Dist. 3, North and South Trunk Sewer Mains. $50,000. Plans deposit $15. Joe J. Rady, 811 American Fidelity Bldg., Fort Worth, engr. CD 2/19/48—ENR 3/4/48.

July 15

N. Y., Jones Beach—Long Island State Park Comm., Babylon, sewage disposal plant. $250,000.

Bids Asked

Tex., Dallas—W. H. Cothrum & Co., 2116 N. Field St., sanitary sewers for low cost rental negro housing. $70,000.

LOW BIDDERS

Calif., Sacramento—Sacramento Co., Courthouse, June 1, sewers in Sutterville Heights Tract, from A. Teichert & Son, Inc., Box 1113, Sacramento. **$77,860.** CD 5/25.

Calif., Visalia—City, City Hall, May 31, sewage treatment plant addn., from Ko Ston Constr. Co., Box 109, Maywood. **$97,570.**

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

June 14	**June 22**
Massachusetts	**California**
South Carolina	**Delaware**
Virginia	**New York**
June 15	**June 28**
Maine	**Oregon**
June 16	**June 29**
Florida	**California**
New Jersey	**Louisiana**
June 21	**June 30**
Indiana	**New Jersey**
Massachusetts	**About July 25**
Wisconsin	**North Carolina**

LOW BIDDERS

●**Alabama**—State Hy. Dpt., Birmingham, May 27, bridges, approaches 0.339 mi. at Centreville, F.A.P. F-289 (2), Bibb Co., from W. A. Mc-Waters, 2 Clayton St., Montgomery, **$206,246;** concrete deck and superstructures 0.559 mi. for First Ave. Viaduct in Birmingham, F.A.P. UG. I-280 (5), Jefferson Co., from Blount Bros. Constr. Co., Tuskegee, **$955,992.** CD 5/19.

Maine—State Hy. Dpt., Augusta, June 1, bridge floor, Augusta Bridge over Kennebec River, F. A. S. FI, UI 389 (2), Contr. 5, Kennebec Co., from Ellis C. Snodgrass, 465 Congress St., Portland, **$175,532.** CD 5/20—ENR 5/26.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

June 14	**June 22**
South Carolina	**California**
Virginia	**New York**
June 15	**June 23**
Louisiana	**California**
Maryland	**June 29**
June 16	**California**
Florida	**Louisiana**
June 17	**June 30**
Washington	**California**
June 21	
Wisconsin	

June 17

†**Tex., Fort Bliss (El Paso P. O.)**—U. S. Eng., P. O. 1538, Albuquerque, N. M., road constr. and paving, sanitary sewers, waterlines in family housing zone, Serial No. Eng-29-005-49-101. $80,000. CD 5/18—ENR 5/26, under Unclassified.

June 20

Tex., Houston—Harris Co., Courthouse, triple base asph. paving, Gruss Rd., Precinct 4, $50,000; triple base asph. paving 3.7 mi. Cedar Bayou-Wooster Rd. and six 25 ft. span, rein.-con. bridge, concrete deck, concrete caps on treated timber piling, $140,000. Howe & Wise, 4119 San Jacinto St., engrs. CD 8/28/47—ENR 9/18/47.

†**Alaska**—Pub. Roads Admin., 419 Federal and Territorial Bldg., Juneau, resurf. 4.9 mi. Mitkof Hy., Tongass National Forest, Proj. 7-A5, B2. Plans deposit $10. CD 8/17/45—ENR 9/6/45.

June 21

†**California** — Pub. Roads Admin., Phelan Bldg., San Francisco, imprv. 3.698 mi. Calif. F.H.-46-A, Harmony Ridge, Tahoe National Forest, Nevada and Placer Counties. Plans deposit $10. C. C. Morris, div. engr.

July 5

Calif., San Mateo — City, City Hall, imprv. portion South El Camino Real. Approx. $50,000. Plans deposit $10. Arthur B. Sullivan, City Hall, city engr.

LOW BIDDERS

Alabama—State Hy. Dpt., Birmingham, May 27, single surf. tr. 4.579 mi. part of Ala. 167 from Bluff north to Wayside Schools, S. P. S.-626-B, Fayette Co., from Miller & McDowell, Greenville, **$91,573*****single surf. tr. 10.521 mi. part Montgomery-Cecil Rd., F.A.S.P. S-266 (1), Montgomery Co., from Jim Goodwyne & Murphree, Troy, **$153,422*****base and tr. 9.442 mi. county road between Pelham and Leeds, F.A.S.P. S-266 (1), Shelby Co., from J. B. Maynard, Alexander City, **$68,099*****base and prime coat 12.835 mi. Ala. 11 from Camden to Monroe Co. line, F.A.P. F-325 (1), Wilcox Co., from J. W. Gwin, Jr., Comer Bldg., Birmingham, **$60,642.** CD 5/19.

†**California** — Pub. Roads Admin., Phelan Bldg., San Francisco, June 2, imprv. 3.298 mi. Proj. Calif.-F.H.-20-A, Western Divide Sequoia National Forest, Tulare Co., from L. A. & S. R. Crow, 4756 Valley Blvd., Los Angeles, **$108,654.** CD 5/25.

†**New Hampshire**—Pub. Roads Admin., 915 Capitol St., Concord, May 27, S-D, Forest Highway Proj., Grafton Co., from John H. Smith, 36 Broad St., Belmont, Mass., **$268,975.** CD 5/9—ENR 5/19.

Tex., Wharton — Wharton Co., Courthouse, June 1, grading, drainage, structures, flexible base 20.19 mi. Contr. A, Precinct 1, and 14.382 mi. Contr. B, Precinct 2, from Wendel Constr. Co., El Campo, **$140,821** est. $160,000 and **$85,-316** est. $110,000. McCormick & Teller, 2711 Grant St., Houston, engrs. B. D. King, co. engr.

●**Virginia**—State Hy. Dpt., Richmond, May 17, furnishing, applying bit. material, from W. M. McIntosh, Hilliard and Staples Rds., Richmond, 166,250 gal. Class B1, **$103,045,** 103,300 gal. Class B2, **$94,043,** both Richmond Dist.***from Burton P. Short & Son, Petersburg, 105,810 gal. Class C1, Richmond Dist., **$67,140*****from Powell & Bolling, Sandston, 325,715 gal. Class B1, Lynchburg Dist., **$60,492*****from Highway Paving Co., Inc., 2924 W. Marshall St., Richmond 98,700 gal. Class C1, Lynchburg Dist., **$170,562;** 433,514 gal. Class B4, Suffolk Dist., **$102,787*****from J. R. Ford Co., Inc., Lynchburg, 23,680 gal. Class C2, Lynchburg, 23,680 gal. Class C2, Lynchburg Dist., **$119,952***** from Adams & Tate Constr. Constr. Co., 2725 Roanoke Ave., Norwich, Roanoke, 352,500 gal. Class B1, **$91,026;** 216,500 gal. Class B2, **$92,334;** 198,200 gal. Class C1, **$143,607,** all foregoing Bristol Dist.; 172,300 gal. Class B1, Salem Dist., **$51,804;** 452,455 gal. Class B3, Suffolk Dist., **$81,970*****from Sam Finley, Inc., 1615 Cleveland Ave., Roanoke, 278,370 gal. Class B2, **$63,-897;** 102,015 gal. Class C1, **$95,475;** 70,900 gal. Class C2, **$86,840,** all foregoing Salem Dist.; Class C1, Staunton Dist., **$97,336*****from Richard F. Kline, Frederick, Md., 43,315 gal. Class B1, Culpeper Dist., **$82,006*****from James Gibbons Co., Relay, Md., 39,300 gal. Class B1, **$55,252;** 39,000 gal. Class B2, **$75,901,** both Fredericksburg Dist. CD 4/29—ENR 5/5. Grand total **$1,738,469.**

Washington—State Hy. Dpt., Olympia, June 3, grading, clearing, draining, surf. 3.157 mi. State Hy. 14, Purdy to Point Fosdick, F.A.P. No. F-009 (1), Unit 1, Pierce Co., from Florito Bros., 1100 Leary Way, Seattle, **$271,375.** CD 5/19—ENR 5/26.

Wash., Yakima—Yakima Co., Courthouse, patching portions 13 mi. Lower Ahtanum, Washington, Occidental, Orchard, Glenside, Carlson, Burton and Church Rds., from Riverside San & Gravel Co., Yakima, **$61,778.**

●†**Alaska**—Alaska Road Comn., Juneau, June 1, clearing, grading, draining, surf. 44 mi. Haines Hy., Haines, from Lyttle & Green, 312 Masonic Temple Bldg., Des Moines, Ia., **$1,594,073.** CD 5/6—ENR 5/19.

CONTRACTS AWARDED

Conn., New Britain—City, P. Wks. Dpt., paving Farmington, Rock Hill and Rockwell Aves., Burritt, Lake and Church Sts., to Angelo Tomasso & Son, Inc., 410 Commonwealth Ave., **$249,967.** George Molleur, City Hall, city engr. CD 2/11—ENR 3/3.

●**Massachusetts** — Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, hy. and bridge work Danvers, to Central Constr. Co., 6 Beacon Ave., Lawrence, **$1,528,785,** Bids 5/17, awarded 5/27. CD 5/24—ENR 5/26, under LB.

New York — Bureau Contracts & Accounts, Albany, 5.61 mi. Northern State Parkway and service roads, Suffolk Co., to Tuckahoe Constr. Co., Inc., 116 Columbus Ave., Tuckahoe, **$988,-917.** Bids 4/20. CD 4/22—ENR 4/28, under LB. Bids 4/20. CD 4/22—ENR 4/28, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

June 16

†**Washington**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, emergency bank protection on Cedar River, Serial No. Eng-45-108-49-214.

June 17

Ohio—George B. Sowers, dir. P. Wks., State Dpts., Bldg., Columbus, clean, spillway and other work on East Branch of Kokosing River, Knox Co. Plans deposit $25.

June 20

Calif., Petaluma—City, City Hall, constructing levee and repairing levee. Approx. $28,000. Plans deposit $15. S. Gonzales, City Hall, city engr.

June 21

†**California** — U. S. Eng., Wright Bldg., Sacramento, levee-setback and bank protection on Miner Slough, River Island below Hollenbeck about 6 mi. N. W. of Walnut Grove, Sacramento Co., Spec. 1491. Plans deposit $10.

June 23

†**Illinois**—U. S. Eng., 826 U. S. Court House & Custom House, 1114 Market St., St. Louis, 1, Mo., approx. 226,000 cu. yd. levee embankment, East St. Louis and vicinity, Proj. Item 1-B (1), Madison Co., Inv. Eng-23-065-49-138. Extended date. CD 4/2—ENR 6/9.

†**Texas**—U. S. Eng., 606 Santa Fe Bldg., Galveston, 2 dredging ranges, Galveston Harbor Entrance Channel, Inv. No. Eng-41-243-49-332. $50,000.

On or About June 29

†**Vermont**—U. S. Eng., Army Base, Boston, 10, Mass., exploratory tunnels at Ball Mountain Dam Site, West River. CD 1/28—ENR 2/17.

July 1

Pa., York—City Council, City Hall, exten. Poor House Run Flood Control Proj., construct 1,070 ft. rein.-con. culvert 10 ft. high, and 8½ ft. wide inside. Plans deposit $20. William E. Weigle, city engr.; adv. ENR 6/16. CD 9/28/44—ENR 10/19/44, under Streets and Roads.

Bids Asked

Tex., Dallas—W. H. Cothrum & Co., 2116 N. Field St., side grading, drainage, levelling, for low cost rental negro housing. $40,000.

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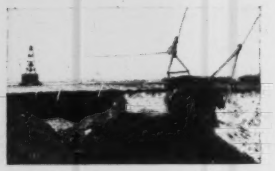

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LOW BIDDERS

†California—U. S. Eng., 74 New Montgomery, San Francisco, June 2, dredge channel at 2 locations in upstream portion of Redwood Creek between junctions with Boundary Slough and Steinberger Slough, San Mateo Co., Spec. 04-203-49-24, from San Francisco Bridge Co., 503 Market St., San Francisco, **$46,088.** CD 5/5.

AIRPORTS AND AIRBASES

BIDS ASKED

June 28

Wash., Yakima—ADMINISTRATION BLDG., etc.—City, City Hall, airport admin. bldg. with paved airplane loading area and auto driveway. $240,000. John Villesvik, Liberty Bldg., archt. CD 11/8—ENR 11/24.

LOW BIDDERS

†N. Y., Schenectady—HANGAR—U. S. Eng., 120 Wall St., New York, Zone 5, June 2, Phase 1, hangar at airport, from F. H. McGraw & Co., 51 E. 42 St., New York, Zone 7. **$665,954.** CD 5/5—ENR 5/26.

†R. I., Quonset Point—RUNWAYS, etc.—Officer Charge of Construction, Pub. Wks. Bldg., Naval Air Station, Quonset Point, May 27, repair seal coat of runways and taxiways, Spec. 21603, from Rhode Island Sand & Gravel Co., Inc., Kilvert St., Warwick. **$59,936.**

†Tex., Ellington Field—AIRFIELD—U. S. Eng., Ellington Field, May 26, rehabilitation 640 bldgs. into Radar School facilities, from W. S. Bellows Constr. Co., 716 N. Everton St., Houston. **$500,309.**

PUBLIC BUILDINGS

BIDS ASKED

June 16

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, masonry West Laboratories, Serial No. 291-49-106. $100,000.

Okla., Stillwater—City, hospital. $250,000. Philip Wiber, Stillwater, archt. CD 12/30—ENR 1/20.

June 17

†Pa., Jenkintown—Pub. Bldgs. Admin., U. S. Custom House Bldg., 2 and Chestnut Sts., Phila., repairing U. S. post office bldg. $20,000. F.W.A.

June 18

†N. W., Albuquerque—U. S. Eng., P. O. Box 1538, 2 unit electric sub-station, Sandia Base, Serial No. 291-49-100. $275,000. Extended date. CD 5/26.

June 20

N. J., Hightstown—Hightstown School Bd., elementary school. $250,000. Micklewright & Mountford, 72 Espina St., Trenton, archts.

Tex., Anahuac—Chambers Co., F. E. Williams, judge, Courthouse, 36-bed, 43x213 ft. and 43x132 ft., brick, concrete, hollow tile hospital. $275,000. Plans deposit $25. Emory S. White, 625 M & M Bldg., Houston, archt. Walter P. Moore, 624 M & M Bldg., Houston, structural engr. Howard, Johnson & Kelly, Scanlan Bldg., Houston, mechanical engrs. CD 3/4—ENR 3/17.

June 21

●Ill., Chicago—Cook Co., County Bldg., 15 story, steel, brick dormitory, concrete slab floors, in West Side Medical Center, 720 S. Wolcott St. $7,000,000. Raymond J. Houlihan, 30 N. Dearborn St., Archt. CD 6/3.

†Alaska, Naknek—Civil Aeronautics Admin., Anchorage, two 4-unit 2 story, basement, 32x46ft., and one 3-unit, 1 story, 20x100 ft. apartments.

June 22

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, officers mess, Serial No. Eng-29-005-49-67. Approx. $250,000.

June 23

†N. M., Los Alamos—U. S. Atomic Energy Comm., Los Alamos, 1,000 seating capacity, masonry auditorium, connecting tunnel, site grading, outside utilities, Inv. 291-49-154. $450,000.

June 24

Calif., South Sacramento—South Sacramento School Dist., 4502 Franklin Blvd., Sacramento, school addn. Approx. $250,000. Plans deposit $25. Geo. C. Sellon, Calif. State Life Bldg., Sacramento, archt.

●Conn., Hartford—Hartford Housing Auth., 846 Asylum Ave., housing, fifty-nine (410 apartment) bldgs., Proj. MR-17. $3,500,000. Plans deposit $100. Kane & Fairchild, 49 Pearl St., archts.

June 25

†N. M., Los Alamos—U. S. Atomic Energy Comm., Los Alamos, Nos. 1, 2 and 3, rein.-con. bldgs. incl. site grading, roads, outside utility lines, Inv. No. 291-49-157. Approx. $300,000 each. Plans deposit $50 each.

June 29

O., Lima—George B. Sowers, dir. P. Wks., Columbus, creamery bldg. (enlarging cold storage facilities) Lima State Hospital. Inscho, Brand & Inscho, 60 E. Broad St., Columbus, Zone 16, archts.

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4063 Ponce de Leon Blvd. Coral Gables, Fla.

June 30

Colo., Aurora—Bd. Educ., School Dist. 28-J, Foster B. Putney, secy. of Bd., 9735 E. Colfax Ave., 2 story high school. $325,000. Plans deposit $25. Aitchison & Klaverstrom, 1254 Monaco Parkway, Denver, engrs. and archts. CD 3/11—ENR 3/31.

●N. J., Salem—Salem County Memorial Hospital, 87 Market St., hospital. $1,145,000. Extended date. The Ballinger Co., 121 N. Broad St., Phila., Pa., archt. CD 5/24—ENR 5/26.

CONTRACTS AWARDED

Me., Portland—City, City Purch. Agt., City Hall, Deering Oaks Jr. High School, Deering and Park Ave., to Camillo Profenno, 26 Free St., Portland. **$831,302.** Bids 5/12. Awarded 5/27. CD 5/25—ENR 6/2, under LB.

●N. Y., Watertown—Bd. Educ., Watertown, high school, to A. Friederich & Son, 120 N. Massey St. **$1,246,987.** Bids 5/20. CD 5/5—ENR 5/12.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., Stonewall Jackson Junior High School, 5200 Polk St., to Schneider Constr. Co., 3004 W. Dallas St. **$255,600.** Bids 5/27. CD 6/6.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., Sidney Lanier Junior High School, to Claude K. Williams Constr. Co., 1917 Westheimer Ave. **$256,000.** Bids 5/10. CD 4/25.

Wash., Walla Walla—School Dist. 140, Junior High School, to Ed. Mardis, Walla Walla. **$465,741.** Bids 5/31. CD 5/18.

LOW BIDDERS

Calif., Yreka—Yreka Union Elementary School Dist., Yreka, June 1, 14 classroom school, from Younger & Hallstein, 575 Mission St., San Francisco. **$297,449.** CD 5/11—ENR 5/19.

Calif., Sacramento—State Div. Architecture, P. Wks. Bldg., Sacramento, June 1, general contract concrete fdns. for 5 story, bsmnt., State Capitol bldg. addn., from Continental Constr. Co., 1402 Front St. **$274,000.** CD 5/9—ENR 5/26.

Ill., Wood River—Bd. Educ. School Dist. 104, Madison Co., Glenn O. De Atley, supt., Lorena St. and Fourth Ave., did not receive bids May 1, 1 story, brick, concrete, steel, stone auditorium-gymnasium and cafeteria addn., Lewis-Clark School, 5 Ave. between Lorena and Acton St. **$510,000.** Project postponed. CD 4/8—ENR 4/21.

Ia., Fort Madison—Bd. Educ., Independent School Dist., Fort Madison, general contract, 2 story, brick, concrete Jefferson and Richard-

son School addns., from Lippert Constr. Co., Oelwein. **$299,500.** CD 3/3—ENR 3/17.

Mo., Perryville — Perry County Memorial Hospital, c/o Bd. Trustees, Gordon Griffin, secy., May 27, 2 story, bsmnt., 50 bed hospital, from Brockmeyer Constr. Co., Missouri Theatre Bldg., 634 N. Grand Blvd., St. Louis, Zone 3. **$525,450.** CD 5/2—ENR 5/19.

COMMERCIAL BUILDINGS

BIDS ASKED

June 15

●**Mo., Kansas City**—Hotel Muehlebach, c/o Trianon Hotel Co., Barney L. Allis, pres., 12 and Baltimore Sts., 12 story, 80x173 ft. brick, steel, rein.-con. air-conditioned hotel addn., and general remodeling present lobby, etc. $1,500,000. Neville, Sharpe & Simon, 1221 Baltimore St., archts. CD 5/3—ENR 5/12.

June 23

Utah, Provo—Utah Valley Hospital, c/o John H. Zenger, supt., Provo, Utah Valley Hospital. $600,000. Fetzer & Fetzer, Tempieton Bldg., Salt Lake City, archts.

After July 1

●**Pa., Pottsville**—Pottsville, hospital Pottsville, hospital addn., **$1,000,000.** The Ballinger Co., 121 N. Broad St., Phila., engr. and archt. CD 4/14—ENR 5/12.

July 30

Tex., Alpine—Paisano Baptist Encampment, c/o S. M. Savaringen, Marfa, 2,000 seating capacity auditorium, concrete and Lamella constr. above concrete floors, etc., at Paisano. Approx. $250,000. Will N. Noonan, 720 Travis Bldg., San Antonio, archt. CD 2/18—ENR 2/24, under CA.

Bids Asked

Del., Newark—Aaron Colish, archt., 121 S. 17 St., Phila., Pa., apartment, Beverly Rd., for Allen S. Hart & John K. Walters, 912 West St., Wilmington, $500,000. CD 6/29—ENR 7/1.

SOON LETS CONTRACT

Wash., Puyallup—Lutheran Chronic Disease Hospital, Puyallup, soon lets contract 5 story, 45x180 ft., re-in-con., frame hospital. **$425,700.** Heath, Gove & Bell, Puget Sound Bank Bldg., Tacoma, archts. CD 5/13—ENR 6/2.

LOW BIDDERS

Ga., Atlanta—Plantation Pipe Line Co., Healey Bldg., June 1, office, from Beers Constr. Co., 70 Ellis St. N. E., **$691,715.** CD 5/6—ENR 5/26.

O., Columbus—Bishop Ready, 198 E. Broad St., rejected bids May 24, Corpus Christi Church and Parish Hall. $450,000. CD 5/4—ENR 5/12.

CONTRACTS AWARDED

Ala., Montgomery—Robert Bonner, c/o contractor, 42 duplex type homes, to Fred Brock, 714 S. Decatur St., Montgomery. Approx. **$500,000.**

Calif., Los Angeles—Bear-Rosenberg-Marton, 2248 Canfield Ave., Zone 24, frame, stucco dwellings, Osborne and Sharp Sts. Owner builds. **$427,000.**

Calif., Richmond—Ray Trenery, 9 Northwood Dr., Orinda, shopping center with 34,000 sq. ft. parking area at San Pablo and Macdonald Aves., to E. Stuart MacIntyre, 8127 E. 14 St., Oakland. Approx. **$400,000.**

Calif., San Mateo—New Bridge Park Realty Co., 180 N. Bayshore Blvd., 100 residences as 1st unit. Owner builds. **$800,000.** CD 2/14—ENR 3/3.

Calif., Walnut Creek—Walnut Creek Homes, Inc., Box 56, Walnut Creek, 26 one story, frame 3 bedroom residences, to Robert R. Platt, Arlene Dr., Walnut Creek. Approx. **$270,000.** Claude A. Stiehl, 31 24 E. 14 St., Oakland, archt.

Conn., Wallingford—Southern New England Telephone Co., 227 Church St., New Haven, 1 story, bsmnt., brick, concrete telephone service bldg., Old Colony St., to Paterson Constr. Co., 66 Anderson St., New Haven. Approx. **$250,000.** CD 5/18—5/25.

Del., Wilmington—Alex Laskaris, 1418 W. 5 St., residential development, Concord Ave., etc., separate contracts. **$250,000.**

N. J., Cape May—Hunts Theatres & Amusements, 3595 Atlantic Ave., Wildwood, theatre and stores, separate contracts, **$250,000.** William H. Lee, 16 S. Broad St., Phila., Pa., archt. Charles H. Wolf, 112 S. 16 St., Phila., Pa., engr.

N. Y., Bayside—Duro Constr. Co., 4 Poatt St., New York, Zone 7, 2 story garden apartments, 211 St. and 126 Ave. Owner builds. **$300,000.** CD 7/30/48—ENR 8/19/48.

●**N. Y., Brooklyn**—Kingsway Gardens, Inc., 14 Washington Pl., New York, 6 story apartments, 2807-21 Kings Hy., **$850,000;** 2705-21 Kings Hy., **$1,000,000;** 2607-15 Avenue O, **$800,000.** Owner builds. Grand total $2,650,000. CD 2/25—ENR 3/10.

N. Y., East Meadow—Syndicate, Nicholas Camp, pres., c/o Samuel Paul & Assoc., archts., 163-18 Jamaica Ave., Jamaica, 100 one-family houses. Owner builds.

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Strike off, vibrate, float and finish in one fast operation

Made in lengths of 6′ to 36′ the new Master Vibratory Finishing Screed (Cat. No. 942) lets you use harsher, more economical mixes. Yet you get a denser, more accurate, harder-wearing concrete surface. With a Master, vibrations penetrate the entire depth and width of the concrete slab. No additional vibration needed regardless of concrete slump or amount of reinforcing steel. Write, wire or phone for prices, specifications, complete information.

Master Vibratory Finishing Screed

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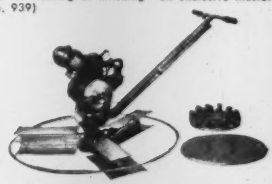

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N. Y., Little Neck—Glen Oaks Shopping Center, Inc., c/o L. V. Berger, archt., 356 Fulton St., Brooklyn, Zone 1, stores, offices and restaurant, Union Turnpike between 255 and 260 Sts. Owner builds. **$500,000.**

N. Y., St. Albans—Sacred Heart Parish, St. Albans, school and convent, 221 St. and 115 Rd., to Frank Droesch, Inc., 110-18 Jamaica Ave., Richmond Hill. Approx. **$300,000.** CD 5/12/47—ENR 5/22/47.

Pa., Doylestown—The Pine Co., Inc., 47 E. Church Rd., Elkins Park, residential development, Union St. etc., separate contracts. **$250,000.**

Pa., Fullerton — Morton Keast, Fullerton, Jordan Park, apartments, separate contract. Approx. **$250,000.**

Pa., Phila.—Sprague Court Apartments, 215 S. 5 St., apartment, Sprague St. and Vernon Rd., to John P. Hallahan Co., Finance Bldg., **$250,000.** James G. Ludwig, 6403 Market St., Upper Darby, archt.

●**Tex., Dallas**—W. H. Cothrum & Co., 2716 N. Field St., 408 unit low cost rental Negro housing. Owner builds. **$1,300,000.** CD 4/28—ENR 5/19.

Tex., Houston—Ayrway Apartments, 5603 San Jacinto St., 10 separate apartments, north side of Lawndale, east of 75 St., own forces. Approx. **$850,000.** Wilson, Morris & Crain, P. O. Box 5262, archts.

Tex., Houston—Central Realty Co., 4550 Griggs Rd., 40 dwellings, concrete slab fdn., Pine Valley sub-division, day labor. **$325,000.**

Tex., Houston—Foster Development Co., 4824 Main St., 45 frame, brick dwellings, concrete slab fdn., Oak Forrest, Sect. 6. Owner builds. Approx. **$450,000.**

●**Tex., Houston**—Katy Park Industrial Development Corp., Joe B. Salmon, pres., c/o 1st. Natl. Bank Bldg., 25 story, masonry, steel concrete office and terminal, to O'Rourke Constr. Co., 4011 Koehler St. Approx. **$12,500,000.** CD 5/25—ENR 6/2.

●**Tex., Houston**—Plumb-Mitchell, Inc., 4550 Griggs Rd., 200 unit 2 story, masonry rental apartment, Plumb Creek area, Winkler Dr. Owner builds. **$1,500,000.** CD 4/29—ENR 5/5.

INDUSTRIAL BUILDINGS

BIDS ASKED

June 14

Del., Seaford—WAREHOUSE—E. I. duPont de Nemours & Co., Inc., Nemours Bldg., Wilmington, warehouse, **$100,000.** E. C. Jones, c/o owner, archt.

June 22

Calif., San Francisco—WAREHOUSE, etc.—Leo J. Meyberg, 70 10 St., Class C, wood frame, concrete wall, warehouse and office. $500,000. J. Francis Ward & John S. Bolles, 369 Pine St., archts. Nemec & Wright, 320 Market St., engrs.

Bids Asked

Tex., Odessa — WAREHOUSE—G. G. Realty Co., Odessa, warehouse. $70,000. George W. Edwards, 1509 A Cochran St., Dallas, archt.

SOON LETS CONTRACT

Conn., Portland — OIL TERMINAL, etc.—Valley Oil Co., Inc., Brownstone Ave., soon lets contract, brick, concrete and steel terminal, warehouse, garage and office, Brownstone Ave. $70,000. Guy Francis Lamb, 252 Main St., Middletown, archt. CD 6/1—ENR 6/9.

●**Kan., Kansas City**—PLANT—Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City, N. J., soon lets contract 4 story, 160,000 sq. ft. floor space brick, concrete, steel mfg. plant. Approx. $2,000,000. Albert Kahn Assoc. Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., archt. and engrs. CD 2/11—ENR 3/3.

LOW BIDDERS

Tex., Houston—WAREHOUSE—G-G Realty Co., Inc., 1606 Young St., Dallas, May 31, 54x254 ft., solid brick warehouse, concrete slab fdn., from O'Rourke Constr. Co., P. O. Box 7557. **$136,000.** Est. $125,000. CD 5/24—ENR 5/26.

CONTRACTS AWARDED

●**Ill., Chicago**—SHOW ROOM, etc.—Packard Motor Car Co., LaSalle and Eugenie Sts., Zone 10, 2 story, basmt., steel, brick show room and administration bldg., to Thorgersen & Erickson, 228 N. LaSalle St., Chicago, **$1,500,000.** CD 4/18—ENR 4/28.

N. J., Trenton — WAREHOUSE — Anchor Warehouse Co., Inc., New York Ave., 1 story, masonry warehouse, to Charles C. Plouth, Yardley-Morrisville Rd., Morrisville, **$68,000.** Arthur N. Rogers, 124 Morningside Dr., Trenton, archt.

N. J., Trenton — WAREHOUSE—The Belair Realty Co., 415 Van Nest St., 14,500 sq. ft. masonry warehouse, to William C. Ehret, 209 Academy St., Approx. **$68,000.** John M. Hirsch, 415 Van Nest St., archt.

Proposal Advertisements see pp. 148 to 150 & 167
Proposed Projects see p. 114

OFFICIAL PROPOSALS

Bids: June 22, 1949 (175)

State Highway Work

Sealed proposals will be received by the State Highway Department at its offices, Dover, Delaware, until 1:00 P. M., E.S.T. (2:00 P.M., E.D.S.T.), June 22, 1949, and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 1025
Federal Aid Project S-107 (3)
Cedar Creek Bridge
Sussex County
Steel and Timber Swing Span

550	C.Y. Excavation
75	C.Y. Structure Excavation
3,000	C.Y. Borrow
200	C.Y. Borrow Pit Stripping
650	C.Y. Selected Borrow
20	M.Ft. Creosoted Timber Structures
75	C.Y. Cement Concrete Masonry
8,000	Lb. Reinforcing Steel
45,000	Lb. Structural Steel
150	L.F. 12" R.C. Pipe
200	L.F. 8" Corr. Metal Pipe
10	L.F. 24" Corr. Metal Pipe
5,000	L.F. Creo. Timber Piles
100	L.F. Timber Test Piles
8	M.Ft. Creo. Sheet Piles
500	L.F. Wood Shoulder Curb
200	L.F. Wire Rope Guard Fence
8	Ea. End Post Attachments
150	S.Y. Sodding
850	Gal. R.C. 1 Asphalt
850	Gal. R.C. 3 Asphalt
68	T. Slag Chips
68	T. Crushed Chips
8,000	Lb. Machinery
2	Each Light Traffic Gates
2	Each Heavy Traffic Gates
	Removal Present Bridge
1	Each 24" Automatic Tide Gate

CONTRACT 1051
Gasoline Requirements
Fiscal Year 1949-50
600,000 Gallons Regular Grade Gasoline
200,000 Gallons Premium Grade Gasoline

CONTRACT 1052
Diesel Fuel Requirements
56,000 Gallons Diesel Fuel Oil

Contract 1025 is a Federal Aid Project and will come under the Provisions of the Federal Aid Highway Act as amended.

The Employment Agency for this contract shall be the Delaware State Employment Service Offices, No. 5 Southeast Front Street, Milford, Delaware.

Attention is called to the Special Provisions in the proposal, specifications and contract agreement.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check, or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. ."

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

The right is reserved to reject any or all bids.

Complete sets of plans and specifications may be obtained after June 6, 1949, upon receipt of five dollars ($5.00) for each contract, which amount will not be refunded. Specifications for Contracts 1051 1052 may be obtained gratis.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
By: J. Gordon Smith, Chairman
W. A. McWilliams, Chief Engineer.
Dover, Delaware
May 25, 1949.

Bids: June 30, 1949 (186)

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 35, Manasquan River Bridge

Construction of the Superstructure of the Manasquan River Bridge on Route 35, Section 40, between Brielle and Point Pleasant Beach, Monmouth and Ocean Counties, Federal Aid Project No. U-53-(4). The work consists of a double leaf bascule span and eight fixed spans. The principal items of construction are:

Estimated:

5,956,420	lbs. Structural Steel
531,600	lbs. Reinforcement Steel
3,742	cu. yds. Concrete
8,340	sq. ft. Roadway & Sidewalk Grating
114,480	lbs. Trunnions & Bearings
109,240	lbs. Machinery

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, June 30, 1949, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements, and by Sections 2, 3 and 4, P. L. 521, 78th Congress, and is to be performed in accordance with the special provisions and requirements of the Federal Works Agency, Public Roads Administration, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 17-19 Main Street, Asbury Park, N. J., and 203 Main Street, Toms River, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all unskilled labor employed on this contract shall be 75¢ per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 75¢ per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.25. Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $5,000.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

(Continued on page 149)

OFFICIAL PROPOSALS
(Continued from page 148)

Bids: July 11, 1949 (183)

Construction of Grading, Drainage, Structures & Paving

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 2:00 P.M. (Eastern Daylight Saving Time), the 11th day of July, 1949, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract and/or contracts:

For the construction of grading, drainage, structures and paving of Turnpike Section 25A, part of the Philadelphia Extension in Clay and West Cocalico Townships, Lancaster County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point 230 feet west of Legislative Route 36128 in Clay Township, at Turnpike Station 645+50 (Lancaster County) thence in an Easterly direction 25,813 feet to a point about 2,000 feet west of Township Route 824 in West Cocalico Township at Turnpike Station 904+67 (Lancaster County) a distance of approximately 4.89 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	465,000 cubic yards
Class II Excavation	28,500 cubic yards
Reinforced Concrete Pavement	137,500 square yards
Class A Concrete	4,400 cubic yards
Class B Concrete	6,400 cubic yards
Plain Steel Bars	1,167,000 pounds

For construction of grading, drainage, structures and paving of Turnpike Section 25B, part of the Philadelphia Extension in West Cocalico Township, East Cocalico Township, and the Borough of Denver, Lancaster County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point about 2,000 feet east of Township Route 824 in West Cocalico Township at Turnpike Station 905+00 (Lancaster County), thence in an Easterly direction 14,374 feet to a point about 1,214 feet east of Township Route 850 in East Cocalico Township (Lancaster County) a distance of approximately 2.72 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	348,000 cubic yards
Class II Excavation	17,000 cubic yards
Reinforced Concrete Pavement	76,000 square yards
Class A Concrete	3,150 cubic yards
Class B Concrete	6,175 cubic yards
Plain Steel Bars	1,025,000 pounds
Fabricated Structural Steel	1,825,000 pounds

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 20th June, 1949. Copies of cross-sections for each section may be purchased from the Pennsylvania Turnpike Commission for the sum of Fifty Dollars ($50.00) per set.

Specifications and contract documents for each section, exclusive of cross-sections, may be obtained from the Commission upon deposit of Ten Dollars ($10.00) for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans, contract documents and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and cross-sections.

The Pennsylvania Turnpike Commission reserves the right to award each section as a separate contract and/or in any combination of contracts.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
May 31, 1949

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

Bids: July 11, 1949 (187)

Water Softening Plant

6 MGD NEW WATER SOFTENING PLANT
HURON, SOUTH DAKOTA

Sealed proposals for furnishing all labor, materials, equipment and constructing a New Water Softening Plant will be received by the Board of Commissioners, Huron, South Dakota, until 2:00 P.M. (CST) on the 11th day of July 1949 and then publicly opened and read.

The work covers the furnishing of labor and materials and equipment installed and constructing the complete New 6 MGD Water Softening Plant, requiring approximately:

PART I	
Excavation	9,500 Cu Yds
Concrete Substructure	2,500 Cu Yds
Superstructure, Brick, or Steel or Concrete Blks. 1 and 2 Stories	114 ft x 182 ft
Plant Piping & Valves	30 Tons
PART II	
HS Motor Pumps	2
Lime Equipment—Bins, Elevator, Chutes, Slaker, Feeders, Filter Equipment for 3—1½ MGD Units.	
Razing & Altering Old Filter Bldg.	
LS Pump Station, altered & 3 New Motor-Pumps, Piping & Valves	
River Intake, Structure & Pipe Line	
Yard Work, HS Main & Ventr. Meter, Wash Sewer & Sanit. Sewer.	

Each proposal shall be accompanied by a Cashier Check or Certified Check on a South Dakota Bank as a guarantee of entering into the Specified Contract and furnishing a 100% Performance Bond. All proposals must be made on the forms to be furnished by the Owners.

Plans, Specifications, Bond and Contract Forms may be seen at the Auditor's Office, Huron or at the Consulting Engineer Office, E. H. Dunmire, 2774 South St., Lincoln, Nebraska or copies of Plans, Specifications, Bidding Forms etc. may be obtained from the Consulting Engineer by the deposit of $50.00, of which, $10.00 will be returned for each set of documents returned at the time of the Letting. Payment for the work will be made monthly, in cash, on the Engineer's Estimates.

City reserves the right to reject any or all bids, or Item Bids in Part II.

J. E. Tschetter, Mayor
W. H. Olson, Auditor

E. H. Dunmire, Consit. Engr.
Lincoln, Nebraska

OFFICIAL PROPOSAL

RATE: The rate for Official Proposal Advertising is $1.00 per line (or fraction) per insertion.

COPY RECEIVED: up to 3:00 P.M. Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

Bids: June 20, 1949 (184)

Pneumatic Tube System

THE PORT OF NEW YORK AUTHORITY
NEWARK UNION MOTOR TRUCK TERMINAL
CONTRACT NJT-8

Sealed proposals for furnishing and installing a pneumatic tube system in the Newark Union Motor Truck Terminal will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 11:30 A. M. Monday, June 27, 1949, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, June 9, 1949.

U. S. Government

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La.—Sealed bids will be received in this office until 11:00 a.m., CST, 17 June 1949, and then opened for the construction of Schooner Bayou Control Structure approximately 18 miles south of Abbeville in Vermilion Parish, La. New Orleans District. Principal quantities involved are approximately 10,000 cu. yds. excavation, 1,600 cu. yds. concrete, 6,800 lbs. cement, 600,000 lbs. steel reinforcement, 17,500 lbs. structural and miscellaneous metal, steel sector gates, operating machinery, and miscellaneous items. Further information on application.

MICHAEL W. STRAUS, Commissioner. (144)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2688) will be received by Bureau of Reclamation, Yuma, Arizona, June 28, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures, Wellton-Mohawk canal, and furnish, Gila main canal, station 750+90.14 and earthwork, concrete canal lining, and structures, Wellton-Mohawk Canal, station 1+84 to station 449. The work is situated 10 to 18 miles east of Yuma, Arizona. Principal items are approximately: excavation, 3,265,000 cubic yards; earth lining, 326,000 cubic yards; concrete, 5,000 cubic yards; and other work. The work is divided into two schedules. Time allowed for completion will be 325 days. For particulars, address Bureau of Reclamation, Yuma, Arizona; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (182)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2689) will be received by Bureau of Reclamation, Trenton, Nebraska, June 29, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of Trenton Dam. The work is situated about 2 miles west of Trenton, Nebraska. Principal items are approximately: 3,500,000 cu. yds. excavation; 2,375,000 cu. yds. embankment; and other work. Time allowed for completion will be 330 days. For particulars, address Bureau of Reclamation, Trenton, Nebraska; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (181)

(Continued on page 150)

OFFICIAL PROPOSALS
(Continued from page 149)

Bids: June 22, 1949 (177)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on June 22, 1949 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good conditions, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 3				
		Wm. Robinson, Dist. Engr., 301 E. Water Street, Syracuse, N. Y.				
Cayuga	FC 49-2	Dry Creek Bridge on Groton-Locke-Moravia	0.29	I-Beam 45.9' Asph. Conc. Opt.	$6,000 Plans $5.00	$100,000.00
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Livingston	SH 49-11 RC 49-68	Genesee By-Pass Genesee-Piffard, S. H. 718	2.44	Alpha $150.50 I-Beams 2 at 60' Thru Truss 160' Conc. 8" Tbk., 20'-22' Wdt.	$50,000 Plans $10.00	$854,000.00
Monroe	E170	Barge Canal Bridge, Long Pond Rd.	0.44	Alpha $54.39 Suspended Span 100' Cantilever Span 2 at 37' Anchor Span 2 at 75' Aspn. Conc. Type 3A	$22,000 Plans $5.00	$404,27135.
		DISTRICT No. 5				
		C. R. Waters, Dist. Engr., 65 Court Street, Buffalo, N. Y.				
Cattaraugus	RC 49-66	Arcade-Farmersville, Pt. 2, S. H. 8115	2.44	Asph. Conc. Opt.	$7,500 Plans $5.00	$130,000.00
Erie	OT 49-4	Ontario Thruway (Walden Ave. to Beach Rd.) and Access Roads	2.32	Grading 0.07 mi. Asph. Conc. Opt.—0.40 mi. Fdt. Crse. Rob Gr. or Slag or Roc Stone 1.85 mi.	$55,000 Plans $10.00	$957,000.00
		DISTRICT No. 7				
		R. F. Hall, Dist. Engr., 444 VanDuzee Street, Watertown, N. Y.				
Clinton	FASS 49-18	Old Military Tpk. Proj. S 71 S167(3)	5.71	Alpha $63.00 I-Beams 84' 32" 6" Treated Gravel; Triple Surf.	$33,000 Plans $20.00	$600,000.00
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Rockland	PSC 6622	Elim. of N. Y. C. R. R. West Shore) Grade Xing with New Main Street (Haverstraw) Elim. of Westside Ave. Crossing	0.28	I-Beams, 49' 8"; 49' 6" Asph. Conc. Opt.	$45,000 Plans $20.00	$833,000.00
Westchester	RC 49-67	District No. 8—Westchester County Tree Trimming	—	Tree Trimming	$500 Plans $5.00	$10,000.00
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick Street, Binghamton, N. Y.				
Chenango	RC 49-64	Ninevel-Afton, S. H. 5200	4.64	Asph. Conc. Opt.	$11,000 Plans $5.00	$211,000.00
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.				
Bronx	FABRP49-2	Bronx River Pkwy. So. Ext. 18th Street Proj. U979(5)	0.40	Total 1497' Steel Viaduct Grd & Struct.	$140,000 Plans $20.00	$2,465,000.00
Bronx	FABRP49-3	Bronx River Pkwy. So. Ext. Gr. Sep. at N.Y., N.H. & Hartford R. R. & Tremont Ave. Proj. No. U979(4); U979(4)	0.17	Steel Girder 2 Spans 82' 10½"; 55' 2½" Steel Girder 100' 9" Grd. & Struct.	$60,000 Plans $20.00	$1,019,000.00
Suffolk	RC 49-65	Quogue-Southampton, S. H. 1274	3.70	Asph. Conc. Opt.	$10,000 Plans $5.00	$180,000.00

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS enable you to get the greatest variety of bids —and so to get the lowest prices consistent with the best work.

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and material and performing all work required for Channel Improvement on Clearwater River, Minnesota, Stage No. 2, will be received in this office until 11:00 A.M., C.S.T., 16 June 1949, and then publicly opened. Further information upon application. (173)

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF SANITARY ENGINEERING, D. C., May 26, 1949. SEALED PROPOSALS will be received in Room 509, District Building, 14th Street and Pennsylvania Avenue, N. W., Washington 4, D. C., until 2:00 P. M., DAYLIGHT SAVING TIME, June 16, 1949, and then publicly opened and read for the construction of STORMWATER AND SANITARY SEWERS, Between New York Avenue and "W" Street, vicinity 15th Street, N. E., Washington, D. C. This project consists of the following: 14½ lin. ft. of 3'6" brick and concrete masonry and 8" dia. cast iron pipe sewer; 16 lin. ft. of brick and concrete masonry transition section and junction chamber; 180 lin. ft. of 12" dia. terra cotta pipe sewer; 7½ lin. ft. of 8" dia. cast iron pipe sewer; 45 lin. ft. of 3'0" dia. brick and concrete masonry sewer; all in OPEN CUT. IN TUNNEL—6.90 lin. ft. of 3'6" brick and concrete masonry and 8" dia. cast iron pipe sewer. Proposal forms, plans and specifications may be obtained in Room 427, District Building. (Telephone National 6000, Extension 2378) (168)

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF SANITARY ENGINEERING, D. C., May 26, 1949. SEALED PROPOSALS will be received in Room 509, District Building, 14th Street and Pennsylvania Avenue, N. W., Washington 4, D. C., until 2:00 P.M., DAYLIGHT SAVING TIME, June 17, 1949, and then publicly opened and read for the construction of IVY CITY TRUNK SEWER—New York Avenue and Kendall Street to 13th and 'W' Streets, N. E. This project consists of the following: OPEN CUT—976 lin. ft. of 7'0" brick and reinforced concrete masonry sewer; 10 lin. ft. of 3'0" dia. brick and plain concrete masonry sewer; 2½ lin. of brick and concrete masonry transition section and junction chamber. IN TUNNEL—870 lin. ft. of 7'0" brick tand reinforced concrete masonry sewer and 30 lin. ft. of 3'0" brick and concrete masonry sewer. Proposal forms, plans and specifications may be obtained in Room 427, District Building. (Telephone National 6000, Extension 2378). (169)

U. S. ARMY, CORPS OF ENGINEERS, New England Division, Army Base, Boston 10, Mass.—Inv. No. Eng-19-016-49-92.—Sealed bids will be received at this office until 2 o'clock p.m., E.D.S.T., on the 22nd day of June 1949, and then publicly opened, for Construction of Mansfield Hollow Dam, Natchaug River, Connecticut, in accordance with specifications and plans, copies of which are available at this office. Deposit of $15.00 per set, in form of certified check or postal money order payable to "Treasurer of the United States" required. (180)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Stage No. 1 of Dam, Lower Lock and Dam, St. Anthony Falls, Minneapolis, Minnesota, will be received in this office until 11:00 A.M., C.S.T., June 23, 1949, and then publicly opened. Further information upon application. (179)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Reconstruction of Apron and Gates, Pine River Dam, Headwaters, Mississippi River, will be received in this office until 11:00 A.M., C.S.T., June 21, 1949, and then publicly opened Further information upon application. (178)

(Continued on page 167)

SEARCHLIGHT SECTION

WANTED

ENGINEERS

Senior Associate Grades..$6191 to $6908 per year
Associate Grades .....$5341 to $6058 per year
Senior Assistant Grades..$4570 to $5048 per year
IN ARCHITECTURAL, CIVIL, SANITARY, ELECTRICAL, MECHANICAL AND STRUCTURAL SPECIALTIES

To prepare plans, specifications and drawings and to supervise construction on a $38,000,000.00 water system expansion program and other municipal projects.

Placement is to be made from lists of applicants qualifying in examinations held daily from May 4, 1949 to August 3, 1949.

It is contemplated that the salaries listed above will be adjusted upward $239.00 per year on July 1, 1949.

Apply immediately stating background and experience, also grade and specialty in which you are interested, to

DETROIT CIVIL SERVICE COMMISSION
15th Floor Water Board Bldg. Detroit 26, Mich.

GRADUATE CIVIL ENGINEER

with broad experience, a substantial portion of which has been in hydraulics. An excellent opportunity with a large public utility located in eastern Pennsylvania. Apply by letter stating education, experience and salary requirements. Address

P-8786, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

WANTED: SUPERINTENDENT for heating, piping and air conditioning contractor located in Central Pennsylvania. Experience necessary. Salary plus commission. Send references and state age and experience in first letter. P-8346, Engineering News-Record.

CIVIL ENGINEERING; College teaching; New England. One position involves Strength of Materials and Mechanics, some opportunity for developments in testing lab.; Master's desirable. Second position involves teaching in Sanitary Engineering along with Mechanics and Surveying; at least Master's degree. Instructor or assistant professor. P-9015, Engineering News-Record.

WANTED: THOROUGHLY experienced estimator for building contractor specializing in public works. Stanley W. Newman Co., Inc., Mobile, Ala.

STRUCTURAL DESIGNERS and draftsmen experienced in bridge work. Middle Atlantic location. Permanent positions for qualified men. P-9053, Engineering News-Record.

HIGHWAY ENGINEER, graduate civil, 30 to 45 with at least 5 years experience in highway design or construction. Concrete pavement experience essential and soils experience desirable. Must be able to write good technical reports. Permanent position with ample opportunity for advancement. Salary $5500 to $4500 depending on age and experience. Location Chicago with some traveling. P-9090, Engineering News-Record.

DRAFTSMAN: WESTERN New York Structural Steel Fabricator will accept applications from men thoroughly experienced in detailing and checking for assistant to chief draftsman. Please give complete resume of experience and expected salary. Replies will be held in strict confidence. P-9102, Engineering News-Record.

WANTED: THOROUGHLY experienced Structural Engineers, Architectural Engineers, High Pressure Piping Engineers and Draftsmen qualified for work on drafting board for design of steam-electric power plants, water and sewage treatment plants. Also experience field engineer qualified to lay-out, check and supervise construction of above. Location southeastern states. State qualifications, references, salary required and earliest date available. P-9125, Engineering News-Record.

RIGGER FOREMAN, experienced in rigging for driving extra long steel H-Piling, for building foundation. State age, experience in full, and all pertinent information. Job located in northern New York state. P-9120, Engineering News-Record.

WANTED

For Large Costruction Project

Northern Chile, 9200', Equable Climate
Eighteen Months Contract—Proven Experience
Ability to Speak Spanish Desirable
UTILITY SUPERINTENDENTS (PIPELINES, CARPENTRY, CONCRETE, ETC.)
COST & FIELD ENGINEERS
DIESEL MECHANIC SPECIALISTS
ELECTRICIANS (HY. EQUIPMENT & GEN. CONST. OPERATIONS)
ACCOUNTANTS
STENOGRAPHERS — MALE BILINGUAL
EARTH & ROCK SUPERINTENDENTS
SAFETY ENGINEERS
WAREHOUSE SUPERINTENDENTS
MECHANICAL SUPERINTENDENTS
PLUMBING SUPERINTENDENTS
OPERATORS

P-8892, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

WANTED BY Up-state New York Building Contractor. Man experienced in purchasing, expediting, handling of sub-contractors and dealing with Architects. Give experience and references. P-9132, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

COMM. SIDELINE Salesman, Iowa, Ills. No. Mo., landscaping, seeding, finished grading, installation of Ornamental & Pipe Railings, etc. Municipal, county, state and individual. Give full information. RW-9110, Engineering News-Record.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service established 1927, is geared to needs of high grade men who seek a change in connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

GENERAL SUPERINTENDENT, 50, of the highest grade available for concern doing major heavy work, bridges, foundations and marine structures. Excellent references. Address PW-9038, Engineering News-Record.

TOP FLIGHT Construction Executive has C.E. and L.L.B. degrees. Many years with pre-war background as Construction Superintendent industrial plant and commercial buildings of large magnitude. Low cost producer and fast completions. Well recommended. Address PW-9039, Engineering News-Record.

PROJECT MANAGER or General Superintendent desires connection with construction company doing foreign or domestic work. Broad experience heavy construction, organization, and over-all management. Large well trained following. Highest references. Available June 1st. PW-9054, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 27 years experience in complete charge of projects consisting of: chemical plants; slip-form concrete structures; material handling and process equipment installations; grain elevators and dryers; cement plants. Under fifty years of age. Will go any location. Further details on interview. PW-8914, Engineering News-Record.

CONTRACTOR'S RIGHT Hand Man; age 36. Experienced Manager-Estimator-Purchasing Agent—On: Commercial, Multi Residential, Industrial Bldg. Construction—including All Utilities;—and Engineered Construction covering Airports, Marine Facilities, Railroads, Roads and Quarry Operation. Desires permanent position as Manager, Estimator, or Purchasing Agent for Gen. Contractor or as Area Sales Manager for Cement Co., Bldg. Supply Co., or w/Equipment Mfg. or Dealer. Good References. PW-8941, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill. In reply state exact salary connected with position open.

SUPERINTENDENT CONSTRUCTION, 25 years institutional, industrial or commercial projects. Anywhere. Engineer. Salary $150.00. PW-8963, Engineering News-Record.

(Continued on page 152)

OVERSEAS POSITIONS

A large American company in South America requires the following personnel.

EQUIPMENT INSPECTORS

Engineers with three to five years refinery experience familiar with pressure vessels, heat exchanges, pumps, piping, corrosion, and erosion. Must have knowledge of API-ASME code as well as physical and chemical properties of metals.

ESTIMATORS

Engineers with five years experience qualified to make field investigations and prepare preliminary design from written descriptions or test sketches relative to cost estimates. Must be experienced in preparing physical capital budgets, appropriations requests, cost analyses, unit costs, cost trends, and making studies pertaining to long range policies for repair, replacement and maintenance programs preferably in refinery operations.

Write, giving age, education, marital status, and detailed description of experience.

Box 308-E
Radio City Station
New York 19, New York

WANTED

CONSTRUCTION SUPERINTENDENT

WITH REFINERY AND HEAVY CONSTRUCTION EXPERIENCE. LOCATION SOUTH NEW JERSEY AND EASTERN PENNSYLVANIA. STATE AGE, EXPERIENCE AND FULL PARTICULARS.

P-8582, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

PIPING SUPERINTENDENT

Construction firm has opening in California for an experienced Piping Supt. Minimum 5 years experience on lump sum contracts. Furnish experience record and photo.

P-8978, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

ESTIMATOR

For underground power and telephone conduit work and gas main construction in greater Boston. Experience essential. Permanent position. Apply by letter only stating qualifications, experience, age, former employers, references, and salary required.

BOND BROS., INC.
77 Ferry Street Everett, Mass.

MAN WANTED

SALES ENGINEER

For selling and promoting asphalt construction and materials. Permanent position and excellent opportunity for right man. State qualifications and references.

SW-8369, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALES MANAGER
AVAILABLE

Construction, mining, and industrial equipment. Twenty-one years complete experience engineering, contracting, distributing, and manufacturing. Civil engineer, age 42, excellent health. Domestic or foreign. Location and contract open.
PW-9105, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED
(Continued from page 151)

FIELD ENGINEER—One years experience doing layout work, and estimating. Recent graduate. Married. Available for employment any place east of the Mississippi, where I can maintain my marital obligations, available July 11, 1949. PW-9025, Engineering News-Record.

CONSTRUCTION OFFICE man, accountant, 40, wants job with reliable company. Fully experienced in full charge of all paper work, 4 years in So. Fla. Prefer Florida or Gulf States. J. J. Quirk, 433-101 Street, Brooklyn, N. Y.

STRUCTURAL ENGINEER, registered wants to take work in contract. Thoroughly experienced in design of bridges and other heavy construction. Large or small contracts efficiently handled. PW-9082, Engineering News-Record.

BUILDING CONSTRUCTION: Thirty years experience covering office management, general supervision, estimating, apartments, hospitals, office buildings, hotels, laboratories, industrial plants. PW-9128, Engineering News-Record.

CIVIL ENGINEERS. A group of June, 1949 graduates of a leading eastern college available for positions as field or office engineers. All are top standing men in their class, veterans, some with previous engineering experience. Interested parties invited to communicate with faculty representative and arrange for personal interviews. PW-9095, Engineering News-Record.

PROJECT MANAGER general or job superintendent. 25 years experience in heavy construction, industrial plants, tunnels, highways, sewerage systems, water works. Handle all trades and sub-contractors, good organizer. PW-9100, Engineering News-Record.

EXPER. ESTIMATOR & Manager. 12 years contracting experience, field and administrative, on heavy construction, locks and dams, river and harbor works, dredging. Responsible charge from estimating and bidding unto completion of projects. Assoc. Member ASCE; MIT graduate. Age 35. PW-9101, Engineering News-Record.

OFFICE MANAGER Chief Accountant, Auditor, 15 years diversified experience in all heavy and housing construction. Go anywhere. Available June 20th. Resume upon request. PW-9074, Engineering News-Record.

CONTRACTORS MANAGER, 20 years experience managing, estimating, supervising for General Contractors, both on Building and Heavy Construction. Location immaterial. Some preference for Southern or Western. Available soon. Salary and bonus basis. PW-9114, Engineering News-Record.

GENERAL OR Job Superintendent: Pier, dock, trestle, subaqueous pile and pipe work and bulkheads. Land piles and caissons of all types including wood, steel, precast concrete, cased and uncased concrete, pedestal and projectile piles. Also underpinning and heavy concrete work. 18 years experience. Engineering background. Capable of organizing and coordinating from estimate to final. Foreign work preferred. Available on or about July 1st. PW-9121, Engineering News-Record.

MECHANICAL ENGINEER, B.S., 32, single, 7 years thermodynamic and stress analysis, layout, and test of rotating machines, reliable, accurate worker with inventive ideas, wants industrial design or development work. PW-9125, Engineering News-Record.

SELLING OPPORTUNITIES WANTED

GOING TO establish residence in Florida seeking a sales position or a distributorship in contractors equipment or building equipment. Have had thirty years experience in these two fields. I am in the upper forties and very aggressive. SA-9030, Engineering News-Record.

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Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

The Tamblyn System of Estimating will make a real estimator out of you in a few weeks of your spare time. We are so sure that you will want to learn it, that we will send you our complete home study course for ten days examination absolutely free. If you don't think it is the finest thing you ever saw, just return it and it won't cost you a cent. If you like it and want it, send us $8.75 when 10 days are up and $7.50 per month until $38.75 is paid.

This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

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SALES POSITION with progressive organization. Long experience in construction and construction equipment field. Eastern territory preferred. Have huge acquaintanceship and following in greater N. Y. and L. I. areas. SA-9122, Engineering News-Record.

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Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D. C.

WANTED
Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.
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WOOD BORER KITS
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$149.95

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AIR COMPRESSORS

Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.
Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.
Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
Gardner-Denver two-stage 160 ft., skid mounted.
Worthington 210 cubic foot, two-stage air-cooled, on steel wheels, Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cu. ft. two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

QUARRY EQUIPMENT & BINS

New 16 x 16 double clamshell gates.
20" x 6'6" Belt Type Magnetic Separator.
Practically new Jeffrey type VS, 28'6" centers, bucket elevator, 6 x 4 buckets, belt mounted, fully enclosed, can extend to 80'.
Link-Belt style 146 vertical centrifugal discharge bucket elevator, belt type, fully enclosed, extendable to 65'.
18 x 36 Farrell deep jaw crusher, with McLanahan 3' x 7' roll type feeder.
10 x 36 Cedarapids, practically new.
10 x 20 Champion No. 4½ primary jaw crusher.
10 x 7 Allis Chalmers Blake type jaw crusher.
Williams 20-S pulverizer.
Cedarapids No. 1 Kubit.
36 x 36 Jeffrey Flextooth pulverizer.
100 ton 3 compartment storage or aggregate bin with or without batcher and scales.
60 ton 2 compartment storage bin with clam shell gates.

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New & Rebuilt—All Sizes
3 to 125 HP in stock
Open and Totally Enclosed

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1½-ton Ford & Chevrolet.
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2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

DIESEL GENERATORS

7½ KW to 125 KW. Alternating and direct current.

SHOVEL

Osgood 1¾-yd diesel powered shovel with 23' boom, 17' dipper stick, 1¾-yd dipper D13000 diesel engine. Excellent condition.

GASOLINE AND DIESEL ENGINES

New JXD Hercules Gasoline.
Buda, Hercules, Hill diesels, rebuilt.
New Murphy 4 and 6 cylinder diesels.
GM 6 and 12 cylinder diesels, practically new.
New Cummins 6 cylinder diesels for Euclids.

SHOVEL ATTACHMENT

Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.
Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS #5877, new ¾-yd dipper LBS#7750.
P&H 203A, LBS#2527, 19'6" boom 13' stick ⅝-yd dipper.
Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

BACKHOE ATTACHMENT

Lorain 41 backhoe, LBS#5429, with 18' boom, 7' stick, 36" cutting width Amsco bucket. Will fit any ¾-yd Lorain with serial number over 9,000.

DRAGLINE FAIRLEADS

New Osgood ½-yd Model 200.

BACKHOE BUCKETS

¾-yd Lorain, 40, LBS#6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS #1033, good condition.
26" outside width solid bottom type LBS #4377, good condition.

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McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Bucyrus-Erie 20B, ¾-yd LBS#3801.
Lorain 41, ¾-yd, LBS #7433, new condition.
New Lima 1-yd, Amsco, LBS#2295.
Bucyrus-Erie 1¼-yd gas air, LBS#3782, fair.
Lorain 75 manganese 1¼-yd, LBS#7233, teeth and bail.
Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS#2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS#5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#6153.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#5763.

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Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.
Jaeger Model 14DL, non-tilt mixer, rebuilt.

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Jaeger type "L" double screed, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.
Koehring 10'-16' finisher, rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader, new 1943. New condition.

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830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
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- 2 FWD Trucks
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42"	5	1/8" — 1/16"	20"	5	1/8" — 1/32"
36"	6	1/8" — 1/16"	20"	4	1/8" — 1/32"
30"	6	1/8" — 1/16"	18"	4	1/8" — 1/32"
30"	5	1/8" — 1/16"	16"	4	1/8" — 1/32"
26"	5	1/8" — 1/32"	14"	4	1/16" — 1/32"
24"	5	1/8" — 1/32"	12"	4	1/16" — 1/32"

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	14"	6	8"	6	4"	5
	12"	6	8"	5	4"	4
	12"	5	6"	6	3"	4

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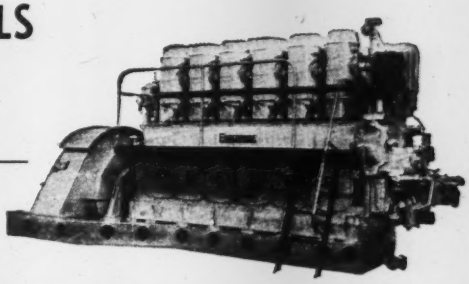

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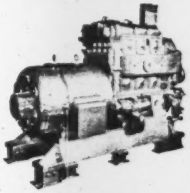

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FS-9049, Engineering News-Record
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(Continued from page 150)

Bids: July 6, 1949 (176)

Construction of Grading, Drainage Structures & Paving

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Daylight Saving Time), the 6th day of July, 1949, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract and/or contracts:

For construction of grading, drainage, structures, and paving of Turnpike Section 27B, part of the Philadelphia Extension, in Wallace, and Upper Uwchland Townships, Chester County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point 800 feet East of Township Road 421 in Wallace Township at Turnpike Station 400+03.85 (Chester County) thence in an easterly direction 20,198 feet to a point, 600 feet East of L.R. 147 at Turnpike Station 602+00 (Chester County) a distance of approximately 3.825 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	720,500 cubic yards
Class II Excavation	21,400 cubic yards
Reinforced Concrete Pavement	106,900 square yards
Class A Concrete	1,600 cubic yards
Class B Concrete	7,000 cubic yards
Plain Steel Bars	641,000 pounds
Fabricated Structural Steel	460,000 pounds

For construction of grading, drainage, structures, and paving of Turnpike Section 27C, part of the Philadelphia Extension, in Upper Uwchland, Uwchland, West Pikeland and Charlestown Townships, Chester County, Commonwealth of Pennsylvania. This section being situated as follows.

Beginning at a point 700 feet West of Legislative Route 147 in Upper Uwchland Township at Turnpike Station 601+0 (Chester County) thence in an easterly direction 22,073 feet to a point 100 feet East of L.R. 15189 at Turnpike Station 813+23 (Chester County) a distance of approximately 4.18 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	629,000 cubic yards
Class II Excavation	30,000 cubic yards
Reinforced Concrete Pavement	134,000 square yards
Class A Concrete	3,000 cubic yards
Class B Concrete	2,900 cubic yards
Plain Steel Bars	1,015 pounds
Fabricated Structural Steel	1,028,000 pounds

For construction of grading, drainage, structures, and paving of Turnpike Section 28A, part of the Philadelphia Extension, in Charlestown Township, Chester County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point 100 feet East of Legislative Route 15189 in Charlestown Township at Turnpike Station 818+23 (Chester County) thence in an easterly direction 23,377 feet to a point 1400 feet East of L.R. 15134 at Turnpike Station 105+0 (Chester County) a distance of approximately 4.43 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	676,000 cubic yards
Class II Excavation	23,300 cubic yards
Reinforced Concrete Pavement	122,400 square yards
Class A Concrete	1,900 cubic yards
Class B Concrete	3,600 cubic yards
Plain Steel Bars	869,000 pounds
Fabricated Structural Steel	1,466,000 pounds

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 13 June 1949. Copies of cross-sections for each section may be purchased from the Pennsylvania Turnpike Commission for the sum of Fifty Dollars ($50.00) per set.

Specifications and contract documents for each section, exclusive of cross-sections, may be obtained from the Commission upon deposit of Ten Dollars ($10.00) for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans, contract documents and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and cross-sections.

The Pennsylvania Turnpike Commission reserves the right to award each section as a separate contract and/or in any combination of contracts.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYVANIA TURNPIKE COMMISSION
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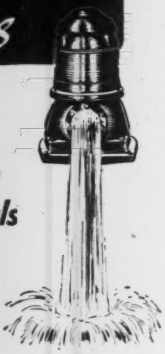

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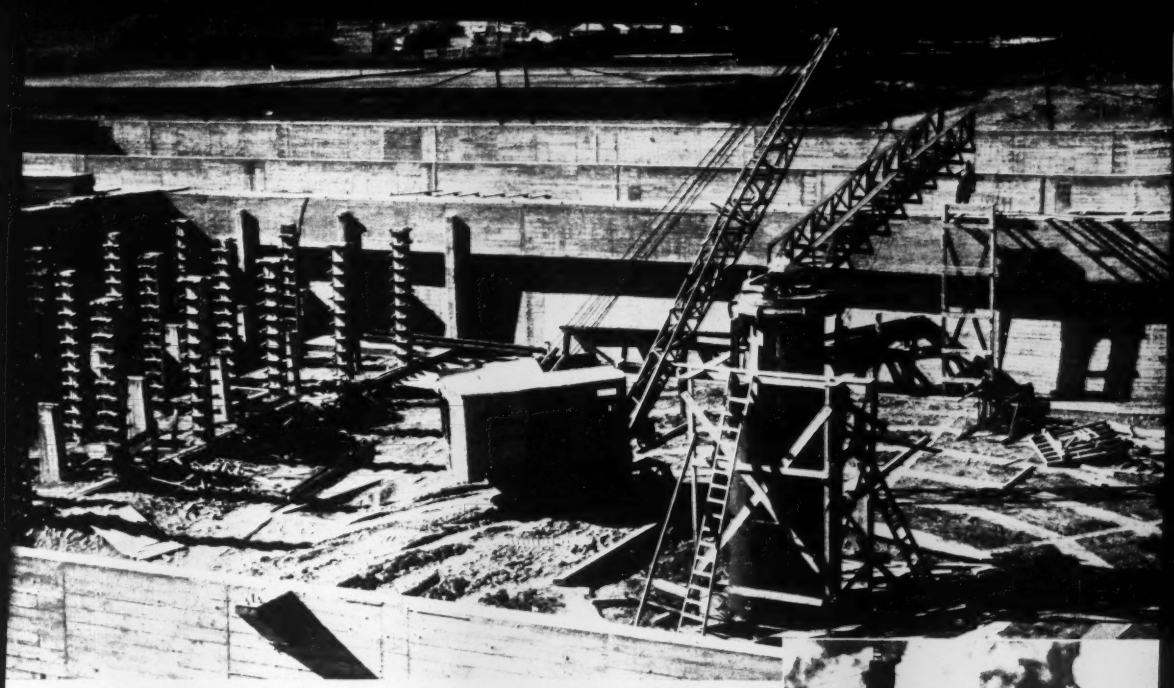

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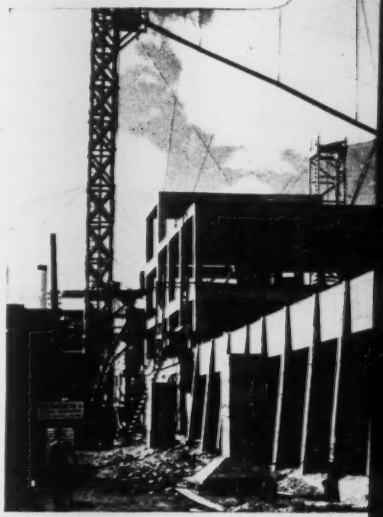

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